NN10265-111

Multimedia Communication Portfolio

Multimedia Communication Server

RTP Media Portal Basics

MCS 5100 3.5 Standard 4.0 January 2006

NORTEL

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Link to	Takes you directly to the
Latest Software	Nortel page for MCS 5100 software located at www130.nortelnetworks.com/cgi-bin/eserv/cs/main.jsp?cscat=SOFTWARE&resetFilter=1&tranProduct=12482.
Latest Documentation	Nortel page for MCS 5100 documentation located at www130.nortelnetworks.com/cgi-bin/eserv/cs/main.jsp?cscat=DOCUMENTATION&resetFilter=1&tranProduct=12482

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Overview

How this chapter is organized

This chapter is organized as follows:

Functional description

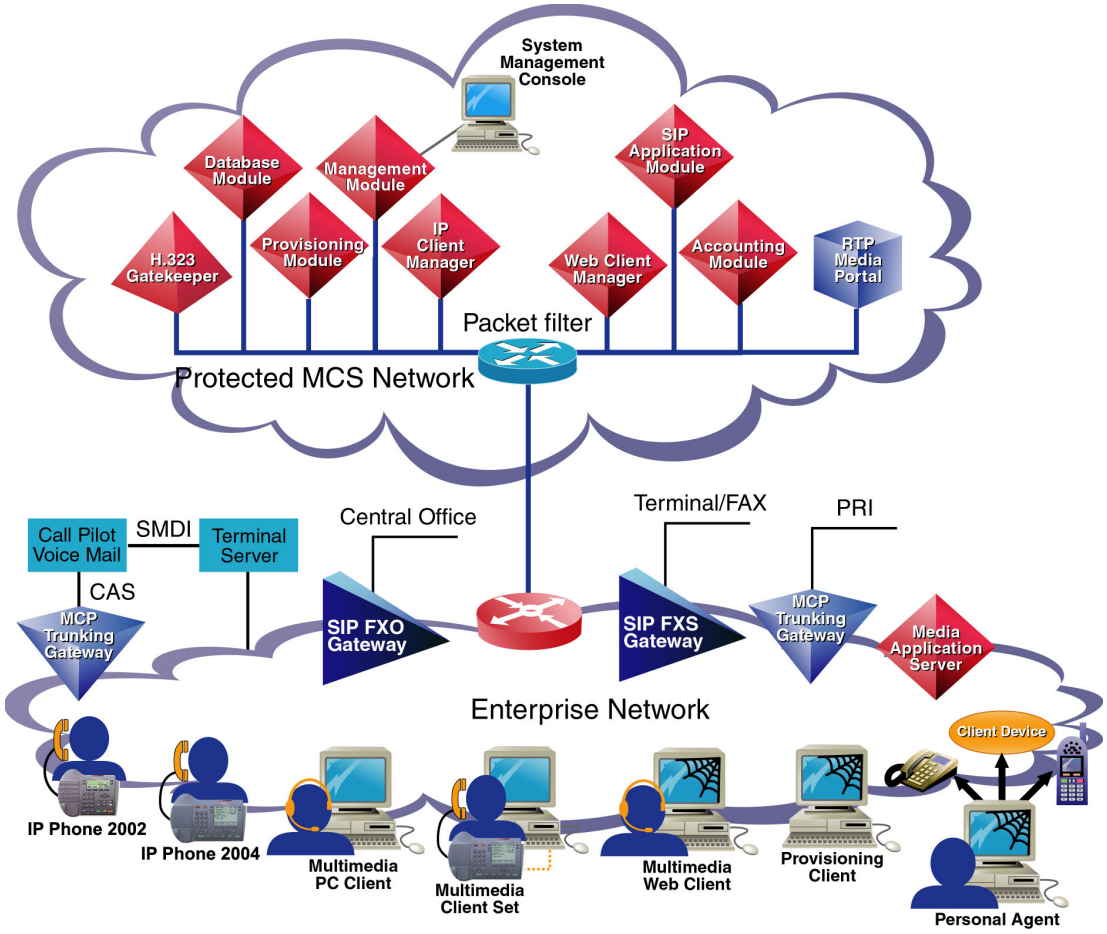
The Real-time Transport Protocol (RTP) Media Portal is an optional component that addresses media plane specific issues with advanced service delivery, Internet addressing efficiencies, and system security.

The primary function of the RTP Media Portal is to extend the reach of multimedia services so that they are accessible to obscured endpoints, devices residing behind a firewall, or a Network Address Translation (NAT) and/or Network Address Port Translation (NAPT) device. Functioning as a media NAPT point that shields Multimedia Communications Platform (MCP) Service Network components from external exposure, the RTP Media Portal also provides IP address/port pair mapping between internal and external network components as well as media anchoring and media pivot abilities for terminals.

The RTP Media Portal may be deployed in a single- or dual-network configuration. For dual-networks, the RTP Media Portal enables elements in the Protected MCS Network to safely communicate with elements in the Managed IP access network.

Figure 1, Network component topology, on page 8 is a graphical depiction of the RTP Media Portal's position in a single-network MCS solution.

Figure 1 Network component topology



Hardware

The RTP Media Portal resides on a Motorola* CPX8216T platform, a 16-slot CompactPCI (cPCI) chassis design.

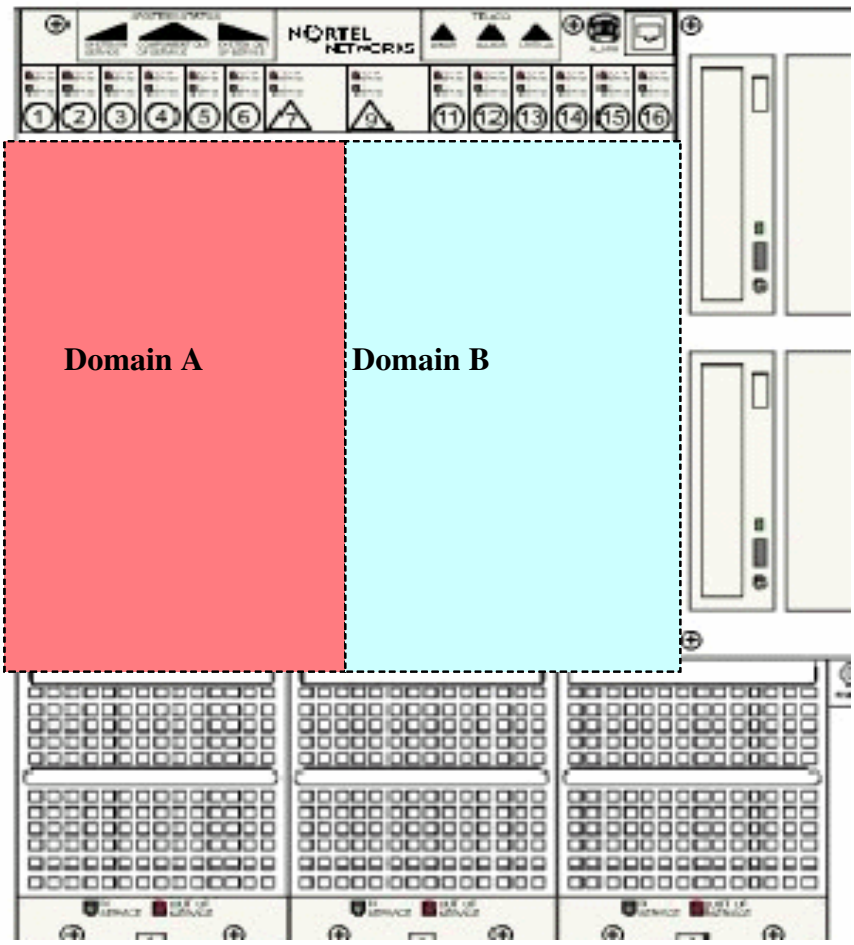
The chassis offers a High Availability platform that provides the basic operating environment (such as power, backplane, cooling, and mounting slots) required to sustain the resident subcomponent single-board computers. The CPX8216T hardware architecture partitions the chassis into separate logical operational Domains,

dividing the chassis shelf into two half-shelves consisting of 8-slots each.

Note: The chassis logical Domains are not internet Domains. Rather, the term is used to identify Side A and Side B of the chassis. Other terms used interchangeably include: Domain A and Domain B, Left Domain and Right Domain, and half-shelf.

An RTP Media Portal occupies a single logical operational Domain in the CPX8216T. A single CPX8216T chassis can host two RTP Media Portal components (one in chassis Domain A, the other in chassis Domain B) as shown in Figure 2, Card slot associations for the two logical Domains in a single chassis, on page 9.

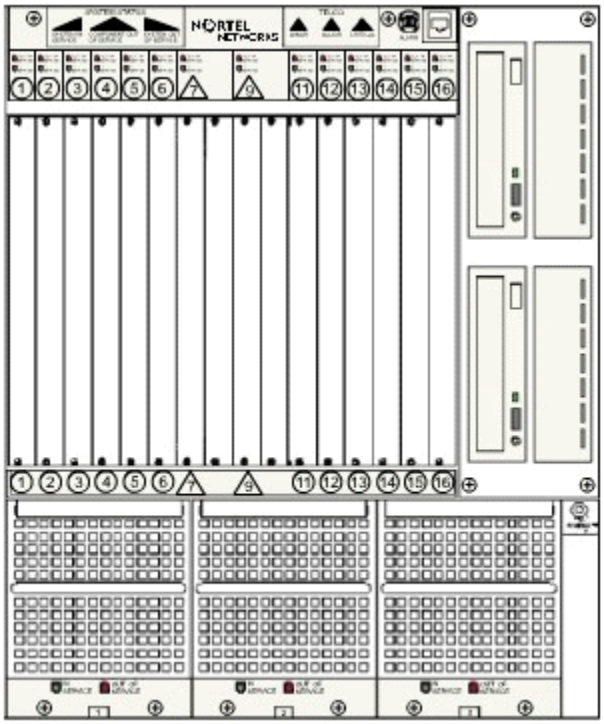
Figure 2 Card slot associations for the two logical Domains in a single chassis



If the chassis is viewed from the front, the slots are numbered from left to right (1-16). If viewed from the rear, the slots are numbered from right

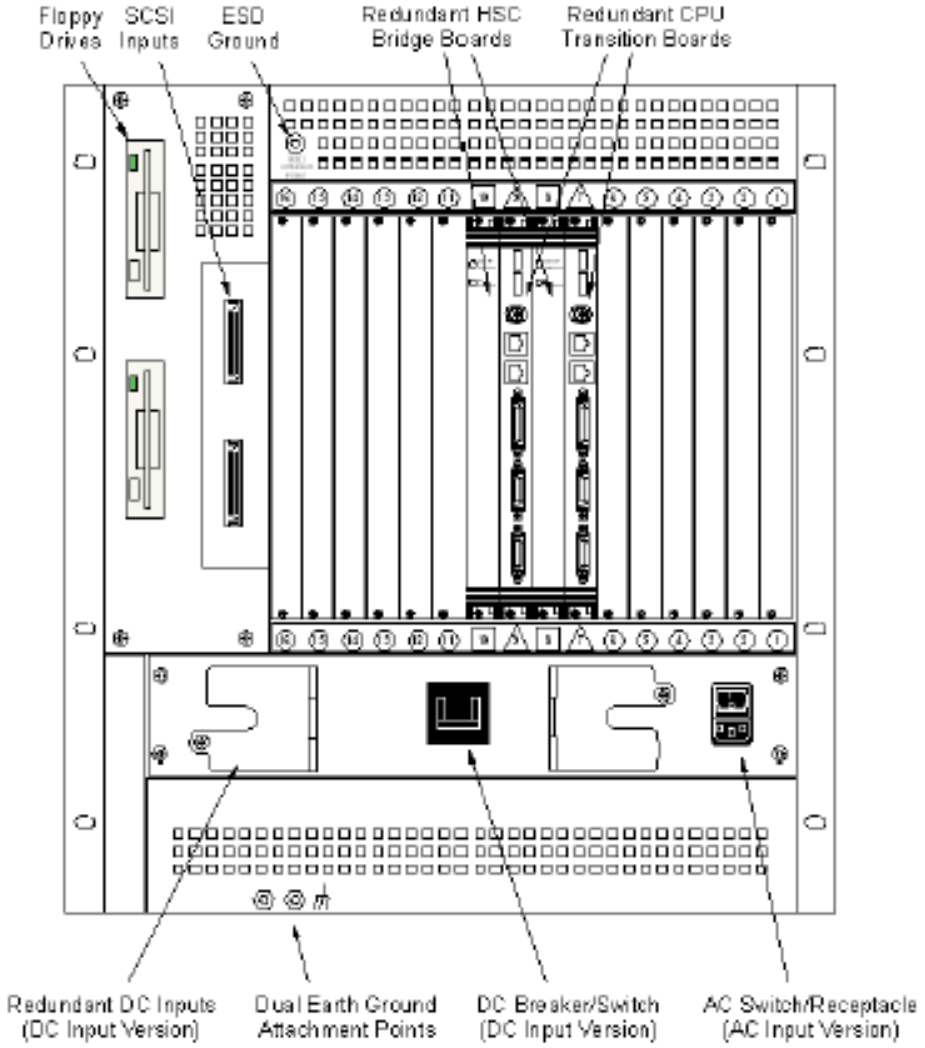
to left (1-16). A front view of the CPX8216T is shown in Figure 3, Motorola chassis CPX8216T - front view, on page 10.

Figure 3 Motorola chassis CPX8216T - front view



A rear view of the CPX8216T is shown in Figure 4, Motorola chassis CPX8216T - back view, on page 11.

Figure 4 Motorola chassis CPX8216T - back view



Within the CPX8216T dual 8-slot architecture, each logical Domain in the chassis contains a dedicated host card (with an associated transition module in the rear), a slot dedicated to the Motorola Hot Swap Controller (HSC), and the remaining six slots which may be populated with Media Blades (media input/output cards with an associated transition module in the rear).

The Hot Swap Controller in the Left Domain controls the Right Domain. The Hot Swap Controller in the Right Domain controls the Left Domain.

Each logical Domain, and therefore each RTP Media Portal, consists of the following hardware components:

- a single CPV5370 Intel processor board (the host card) with 1 GB memory, a SCSI input/output (I/O) daughter board, and rear Transition Module.
- Hot Swap Controller and Bridge (HSC) module
- SCSI CD-ROM drive
- SCSI hard drive
- Floppy drive
- One (or more) Motorola MCPN765 Power PC processor board (the Media Blade), with 64 MB RAM and associated Rear Transition Module.
- Available AC or DC power options

Customer provided requirements include:

- Mouse
- Keyboard
- Monitor

Software

The RTP Media Portal is primarily a software entity that is comprised of subcomponents distributed across the hardware platform.

The RTP Media Portal, servers and components must be configured and provisioned under the same site as the management server, even if deployed from a remote location. Failure to deploy the RTP Media Portal under the same site as the management server will prevent OMs, logs, and alarms form being managed from the System Management Console. For more information regarding network configuration, refer to *MCS 5100 Network Engineering and Deployment Guide (NN10313-191)*.

For information regarding maintenance updates, refer to Maintenance updates on page 19. For information regarding the upgrading of RTP Media Portal software releases, refer to Full release upgrades on page 27.

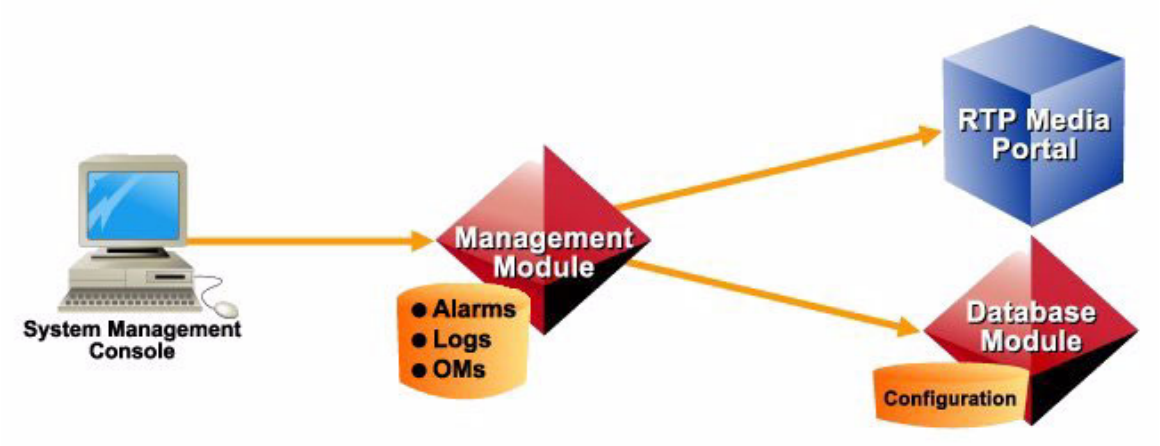
Operations, administration, and management

Operations, administration, and management (OAM) of the RTP Media Portal is available through the System Management Console. This console provides an overall view into the status of the various

components in the system and administrative access to OAM functions (including fault and configuration management).

RTP Media Portal OAM data is stored on both the Management Module and the database. The Management Module stores alarm and log data. Configuration data is stored locally on the RTP Media Portal as well as persistently in the database. For a graphical view of these relationships, please refer to Figure 5, OAM interoperability, on page 13.

Figure 5 OAM interoperability



For additional information, please refer to *MCS 5100System Management Console User Guide*. (NN10273-111)

Interfaces

Protocols

While in service, the RTP Media Portal interfaces with the network through the following protocols:

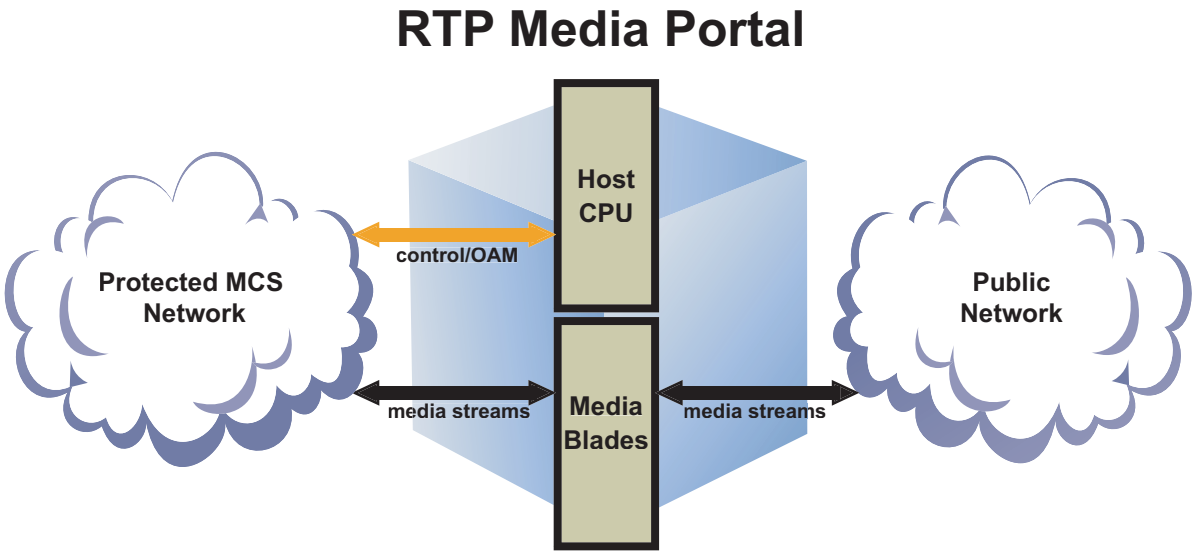
- **MPCP,** Media Portal Control Protocol, used to control messages between the SIP Application Module and the RTP Media Portal. MPCP messages control the making, modification, and breaking of media session connections.
- **RTP**, Real-time Transport Protocol, transports real-time media streams (for example, audio and video) across a packet network.
- **RTCP**, Real-time Transport Control Protocol, provides a means of sharing session data (for example, performance data) between endpoints.
- **UDP**, User Datagram Protocol, provides data-based media streams (for example, file transfer).

- **TCP**, Transmission Control Protocol, communicates configuration, performance data, logs, and alarms (OAM data) between the RTP Media Portal and the Management Module.

Network interfaces

The RTP Media Portal is comprised of two physical hardware subcomponents: a single Host CPU, and up to six (6) Media Blades. The following figure shows an example of RTP Media Portal dual-network connectivity between a Protected MCS Network and a Public Network.

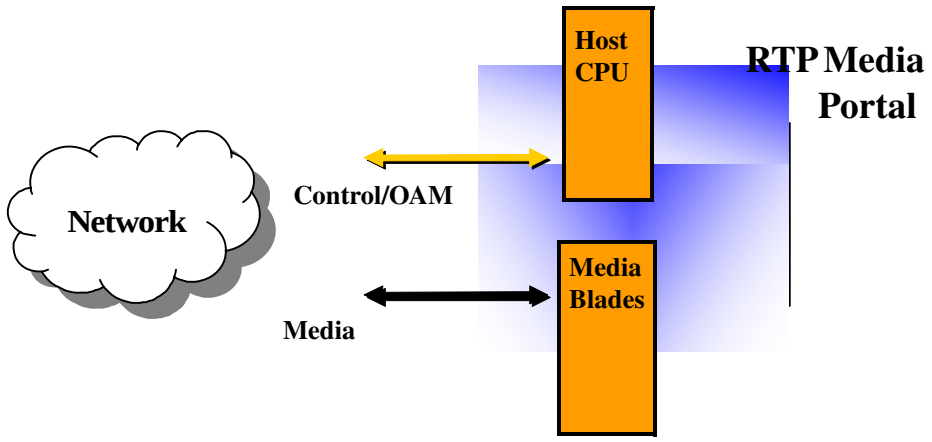
Figure 6 RTP Media Portal operational interface - dual-network deployment



The Host CPU interacts with the management infrastructure to provide OAM capabilities. The Host CPU also provides the control capabilities (MPCP) through which a call controller can access, manipulate, and apply advanced functions to media streams.

The Media Blades provide the Media Packet Engine for processing media streams. A Media Blade can be configured for a dual- (see Figure 6) or single-network deployment (see Figure 7). For single-network deployment, the Media Blade and Host CPU must be on the same local network. This enables the distributed Host and Media Blades to communicate using a non-routable network addressing scheme.

Figure 7 RTP Media Portal operational interface - single-network deployment

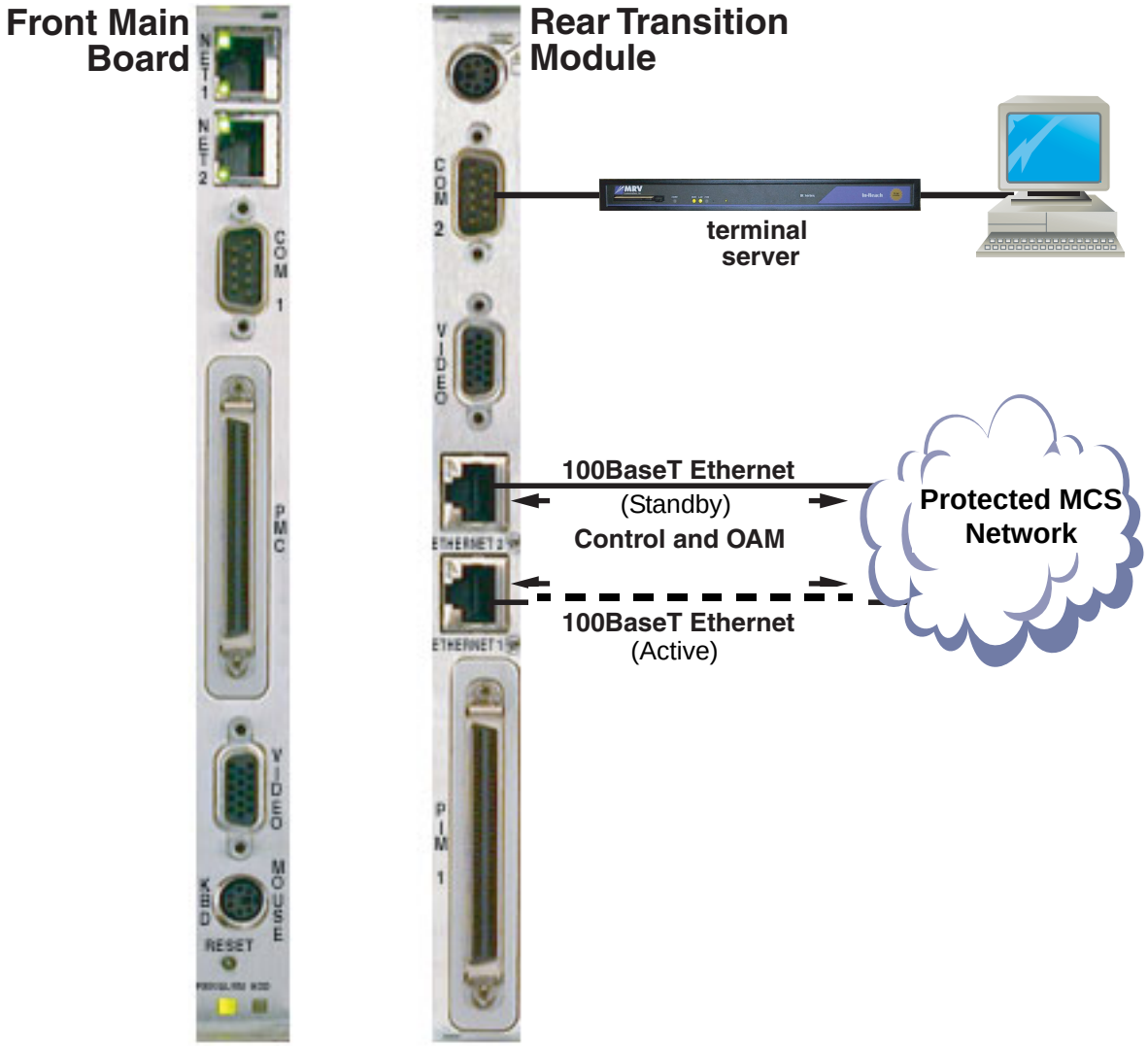


Host CPU

As shown in Figure 8, Control and OAM interface - CPV5370 Host card and RTP Media Portal, on page 16, the Rear Transition Module for the host card (CPV5370) provides the following:

- COM2 port for connection to a terminal server and local monitor.
- Two Ethernet ports which provide connectivity to the Protected MCS Network. The connection carries control and OAM data.
  - The Ethernet 1 port is used to provide an active connection.
  - The Ethernet 2 port provides a standby connection. The standby ethernet function is enabled by default through the “Activate IP Failover” property when configuring the RTP Media Portal. (For additional information, refer to Table 2, RTP Media Portal tab configurable properties, on page 51.)

Figure 8 Control and OAM interface - CPV5370 Host card and RTP Media Portal



These Ethernet connections carry the following:

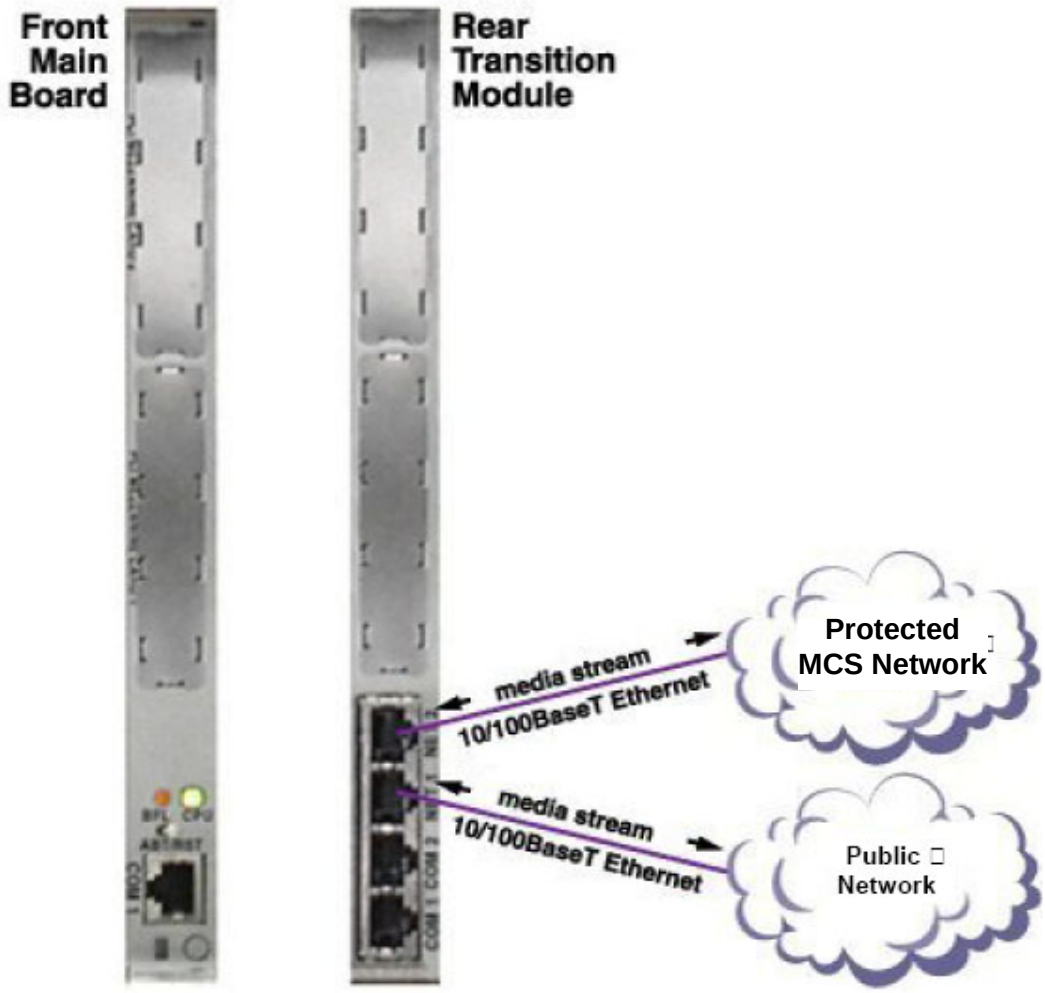
- MPCP control messages to communicate with the SIP Application Module.
- Operations, administration, and maintenance (OAM) data to the Management Module over TCP.
- Internal communications between Host and Media Blades.

Media blades

Network interfaces on each of the Media Blades (MCPN765) in the RTP Media Portal provide a path for media streams. Figure 9, Media stream interface – MCPN765 Media Blade to RTP Media Portal, on page 17

illustrates media stream interfaces in a dual-network deployment between a Protected MCS Network and Public Network.

Figure 9 Media stream interface – MCPN765 Media Blade to RTP Media Portal



A Media Blade in the RTP Media Portal consists of the following input/output cards:

- MCPN765 Front Main Board
- TM-PIMC-0101 Rear Transition Module

There is a 1:1 relationship between the Front Card and Rear Transition Module.

The Rear Transition Module contains two, 10/100 BaseT Ethernet connections for RTP/RTCP/UDP media streams. Each Media Blade (pair of MCPN765 and TM-PIMC-0101 cards) performs the following functions:

- Connectivity for RTP/RTCP/UDP media streams.
- Address and Port Discovery (APD) for obscured media endpoints.
- Relay of media packets between end points.
- An array of NAT and/or NAPT functions.

The NET ports are used as following:

- In a single-network deployment, only the NET2 port is used.
- In dual-network deployment, NET2 is used for connectivity to the Protected MCS Network and NET1 for the other network.

References

The following are referenced in this document and provide additional information:

- *MCS* 5100 *Network Engineering and Deployment*, *NN10313-191*
- *MCS* 5100 *System Management Console User Guide*, *NN10273-111*
- *Provisioning Client User Guide*, *NN42020-105*
- *MCS* 5100 *Fault Management: Alarm and Log Reference*, *NN10385-900*
- *MCS* 5100 *Accounting Module Basics*, *NN10279-111*

Maintenance updates

How this chapter is organized

This chapter is organized as follows:

Functional description

This chapter documents upgrade tasks to be performed when upgrading a maintenance release.

Tools and utilities

Upgrades to the RTP Media Portal are performed through the System Management Console. Please refer to *MCS 5100 System Management Console User Guide (NN10273-111)* for more information.

Operations, administration, and management

The SIP Application Module may try to contact the RTP Media Portal while the update is in progress, potentially generating error logs. To minimize impact to service, the RTP Media Portal should first be SHUTDOWN so that it does not accept new service requests. While shutting down, the RTP Media Portal will continue to process established media sessions. These pre-existing media sessions are cleared as the associated calls end. The RTP Media Portal automatically transitions into the LOCKED state when there are no

active media sessions present. When this occurs, it is safe to proceed with the upgrade without affecting service.

CAUTION

It is possible to update and reboot one RTP Media Portal in a chassis, while the RTP Media Portal in the other half of the chassis continues to run the previous software. Once one RTP Media Portal is updated, the other RTP Media Portal in the chassis can be shutdown, locked, updated, and rebooted. This rolling upgrade will only impact available capacity and will not cause a service outage.

Updating all RTP Media Portals concurrently will cause a service outage.

If an upgrade fails during the initial stages, a rollback to the previous load is performed. A notification of the failure appears within the System Management Console.

If a component upgrade fails after the initial stages of the upgrade, it does not rollback automatically. A dialog box appears in the Management Console stating that the upgrade failed and prompts the administrator to determine whether a rollback should be performed.

Upgrade commands may require several minutes to complete execution and will initiate a reboot of the RTP Media Portal. The length of the reboot is approximately 2-3 minutes. Due to reduced capacity, perform updates during low traffic periods.

Maintenance update tasks

For maintenance updates, administrators may decide to either upgrade the RTP Media Portal component to the latest maintenance release, or downgrade the RTP Media Portal component to a previous maintenance release.

To upgrade or downgrade the RTP Media Portal, the update operation is issued to the RTP Media Portal from the System Management Console. This operation will reboot the host card, which in turn reboots all Media Blades. When the RTP Media Portal recovers from this operation, it is in service (UNLOCKED) with the updated software.

To avoid any conflicts with service requests from the SIP Application Module(s), the following procedure describes the steps that must be

followed when updating a software load for the RTP Media Portal component.

From the System Management Console

1 Shut down the RTP Media Portal component. For details, please refer to Shut down the RTP Media Portal component on page 21.

2 Update the software load for the RTP Media Portal component. For details, please refer to Update the RTP Media Portal component on page 23.

Shut down the RTP Media Portal component

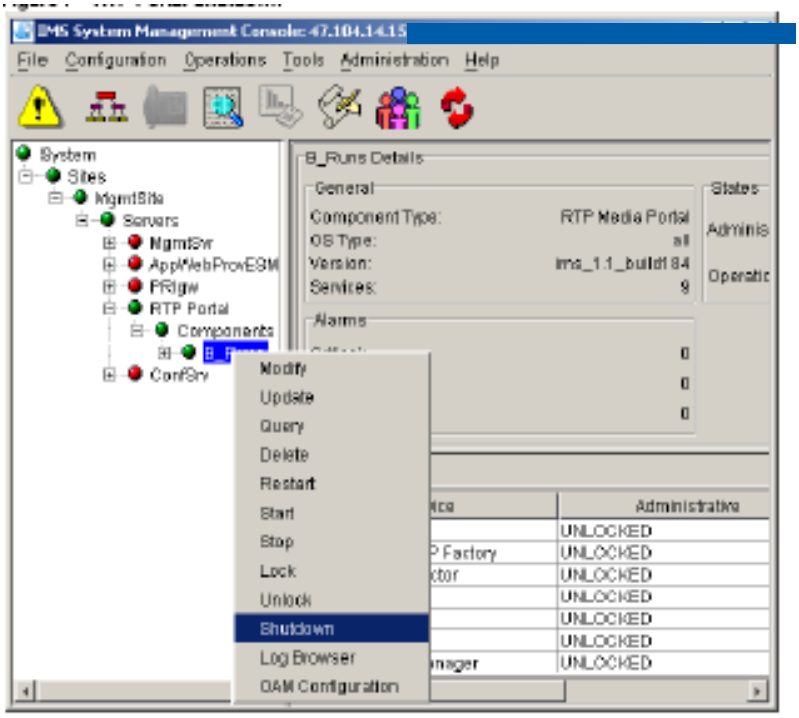
The following procedure describes how to shutdown the RTP Media Portal component. To perform these procedures, the administrator must login to the System Management Console. For detailed procedures on logging into the System Management Console, please refer to *MCS 5100 System Management Console User Guide (NN10273-111)*.

From the System Management Console

1 In the System tree, right-click on the RTP Media Portal component.

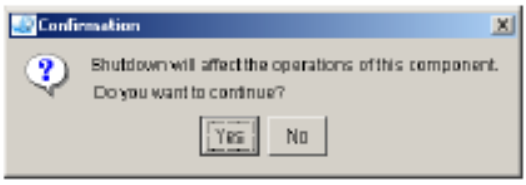
2 From the pop-up menu, select the **Shutdown** command. You can also launch the shutdown command by selecting **Shutdown** from the pull-down **Operations** menu.

Figure 10 RTP Portal Shutdown



3 A confirmation window appears. Click on the **Yes** button to continue.

Figure 11 RTP Portal Shutdown confirmation



4 The RTP Media Portal component shuts down gracefully and eventually goes into a LOCKED state when the last active media session ends (as seen in the General Information Area of the System Management Console).

Update the RTP Media Portal component

The following procedure describes how to update a load for the RTP Media Portal component.

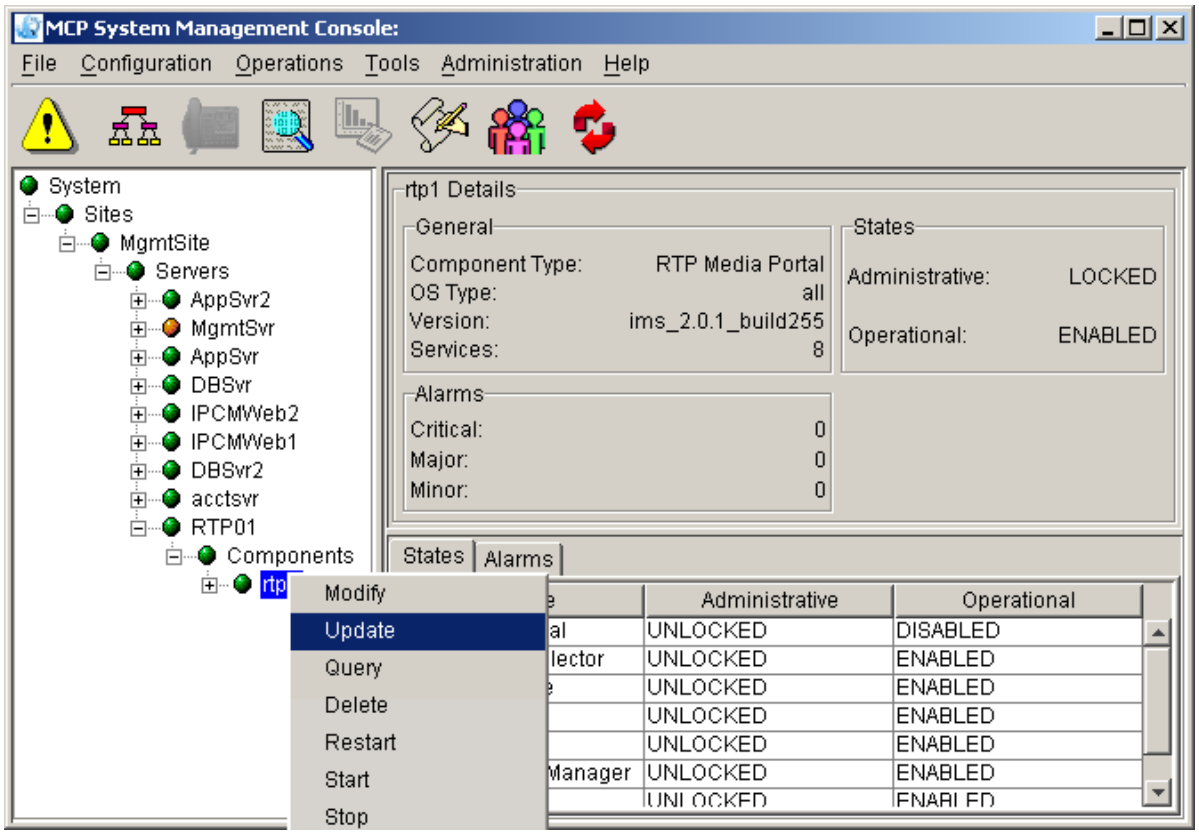
Note: Updates (both upgrades and downgrades) to network components must be performed in a specific order. Please refer to *MCS 5100Basics (NN10270-100)* for further information.

From the System Management Console

1 In the System tree, right-click on the RTP Media Portal component.

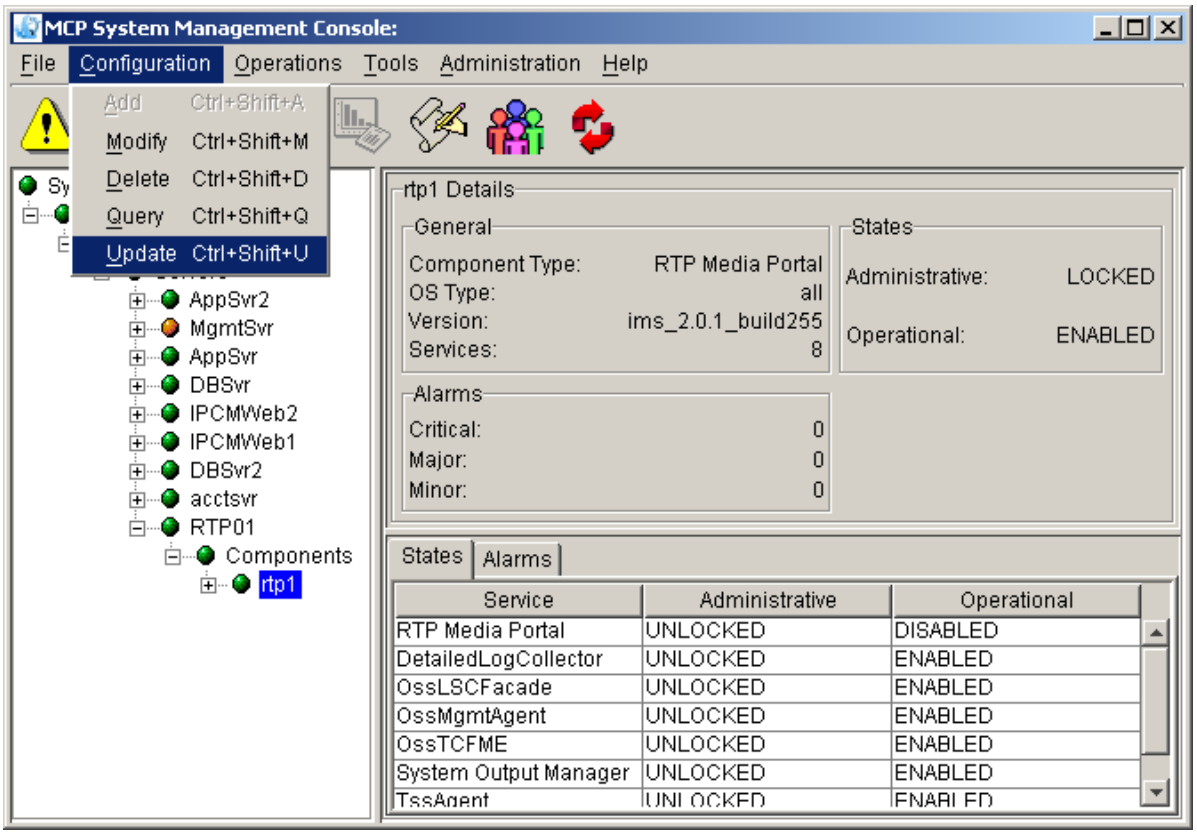
2 From the pop-up menu, select the **Update** command. This command may require substantial time to complete execution.

Figure 12 Update from the pop-up menu



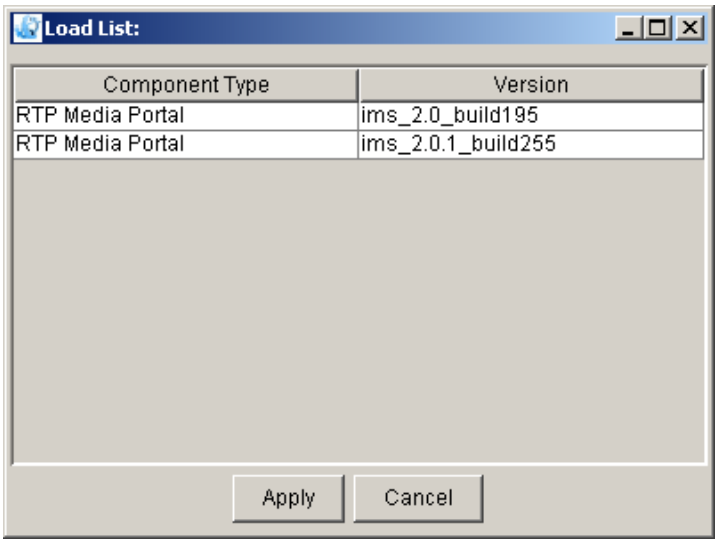
You can also launch the update command from the pull-down Configuration menu.

Figure 13 Update from the Configuration menu



3 The Load List window appears. The window only shows software loads suitable for the RTP Media Portal component type, since this is the component type being updated.

Figure 14 Load list for updating



4 Select the load version that should be used to update the RTP Media Portal. Click on the **Apply** button.

5 The System Management Console displays the RTP Media Portal configuration window. If required, modify any configuration properties. For a description of these properties, please refer to Configuration tabs and properties on page 47. Make changes as needed, then click on the **Apply** button to continue.

6 A window showing the progress of the update appears. Once the update has completed, the Update successful message appears showing that the RTP Media Portal component was successfully updated.

Full release upgrades

How this chapter is organized

This chapter is organized as follows:

Functional description

This chapter documents upgrade tasks to be performed when upgrading to a full release.

Tools and utilities

Upgrades to the RTP Media Portal are partially performed through the System Management Console. Please refer to *MCS 5100System Management Console User Guide (NN10273-111)* for more information.

Operations, administration, and management

The SIP Application Module may try to contact the RTP Media Portal while the update is in progress, potentially generating error logs. To minimize impact to service, the RTP Media Portal should first be SHUTDOWN so that it does not accept new service requests. While shutting down, the RTP Media Portal will continue to process established media sessions. These pre-existing media sessions are cleared as the associated calls end. The RTP Media Portal automatically transitions into the LOCKED state when there are no

active media sessions present. When this occurs, it is safe to proceed with the upgrade without affecting service.

CAUTION

It is possible to update and reboot one RTP Media Portal in a chassis, while the RTP Media Portal in the other half of the chassis continues to run the previous software. Once one RTP Media Portal is updated, the other RTP Media Portal in the chassis can be shutdown, locked, updated, and rebooted. This rolling upgrade will only impact available capacity and will not cause a service outage.

Upgrading all RTP Media Portals concurrently will cause a service outage.

If an upgrade fails during the initial stages, a rollback to the previous load is performed. A notification of the failure appears within the System Management Console.

If a component upgrade fails after the initial stages of the upgrade, it does not rollback automatically. A dialog box appears in the Management Console stating that the upgrade failed and prompts the administrator to determine whether a rollback should be performed.

The length of time required to complete an upgrade is approximately 30 minutes. While there is no impact to call-processing services, perform updates during low traffic periods to minimize reduced capacity.

Upgrade tasks

This section provides instruction for a full release RTP Media Portal upgrade.

From the System Management Console and terminal window

1 Shutdown the targeted RTP Media Portal component. For details, please refer to Shutdown the target RTP Media Portal component on page 29.

2 Delete the previous load of the RTP Media Portal component from the server. For details, refer to Delete the previous load of the RTP Media Portal component on page 30.

3 Perform the upgrade. For details, refer to Upgrade the RTP Media Portal component on page 30.

4 Deploy the upgraded RTP Media Portal. For details, refer to Deploy the RTP Media Portal component on page 31.

Shutdown the target RTP Media Portal component

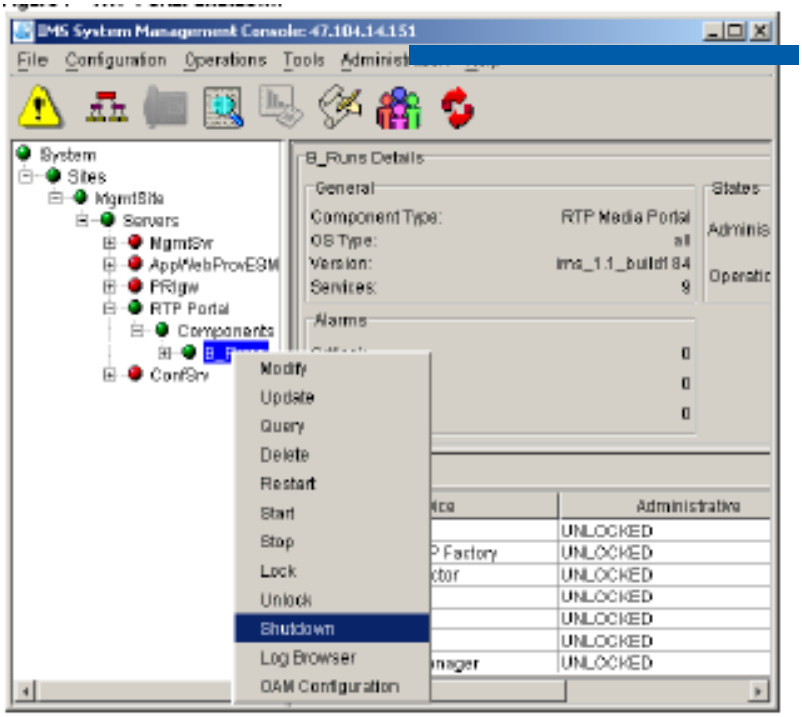
The following procedure describes how to shutdown the target RTP Media Portal component.

From the System Management Console

1 In the System tree, right-click on the target RTP Media Portal component.

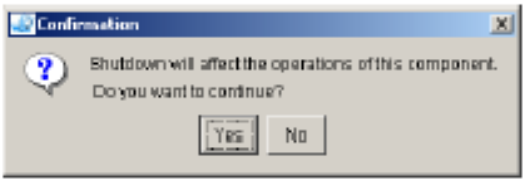
2 From the pop-up menu, select the **Shutdown** command. Users may also choose the shutdown command from the pull-down **Operations** menu.

Figure 15 RTP Portal Shutdown



3 A confirmation window appears. Click on the **Yes** button to continue.

Figure 16 RTP Portal Shutdown confirmation



4 The RTP Media Portal component shuts down gracefully and eventually goes into a LOCKED state when the last active media session ends (as seen in the General Information Area of the System Management Console).

Delete the previous load of the RTP Media Portal component

The following procedure describes how to delete the previous load of the RTP Media Portal component.

From the System Management Console

1 In the system tree, right-click on the target RTP Media Portal component.

2 From the pop-up menu, select the **Delete** command.

This command removes the previous load, preventing problems that might occur if an older build is brought into service on top of a newer one.

Upgrade the RTP Media Portal component

The following procedure describes how to upgrade the RTP Media Portal load. Use Terminal Server access, or the main console with keyboard and monitor attached.

From a terminal window

1 Log in as **root** on the target RTP Media Portal.

2 Insert the upgrade CD into the associated CD-ROM.

3 Mount the CD.

mount /dev/cdrom <Enter>
mnt/cdrom <Enter>

4 Change directory to the top-level directory on the CD.

cd /mnt/cdrom <Enter>

5 Run the install script.

./install <Enter>

6 Change directory.

cd <Enter>

7 Dismount the CD.

umount /mnt/cdrom <Enter>

8 Eject the upgrade CD from the CD-ROM.

eject <Enter>

9 Remove the upgrade CD from the CD-ROM.

10 Repeat step 2 through step 9 for each upgrade CD.

11 Reboot the RTP Media Portal.

reboot <Enter>

Deploy the RTP Media Portal component

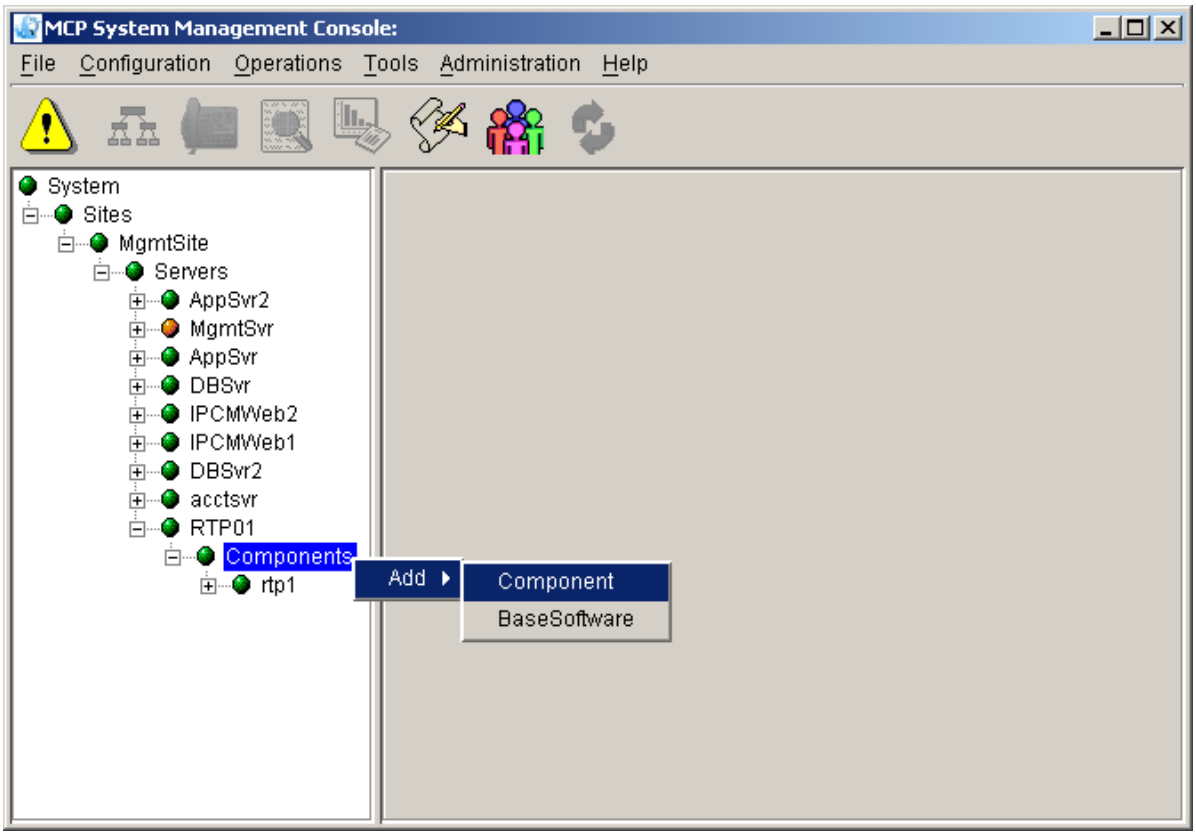
This section provides instruction to deploy the upgraded RTP Media Portal component.

From the System Management Console

1 In the System tree, right-click **Components** under the appropriate RTP Media Portal server.

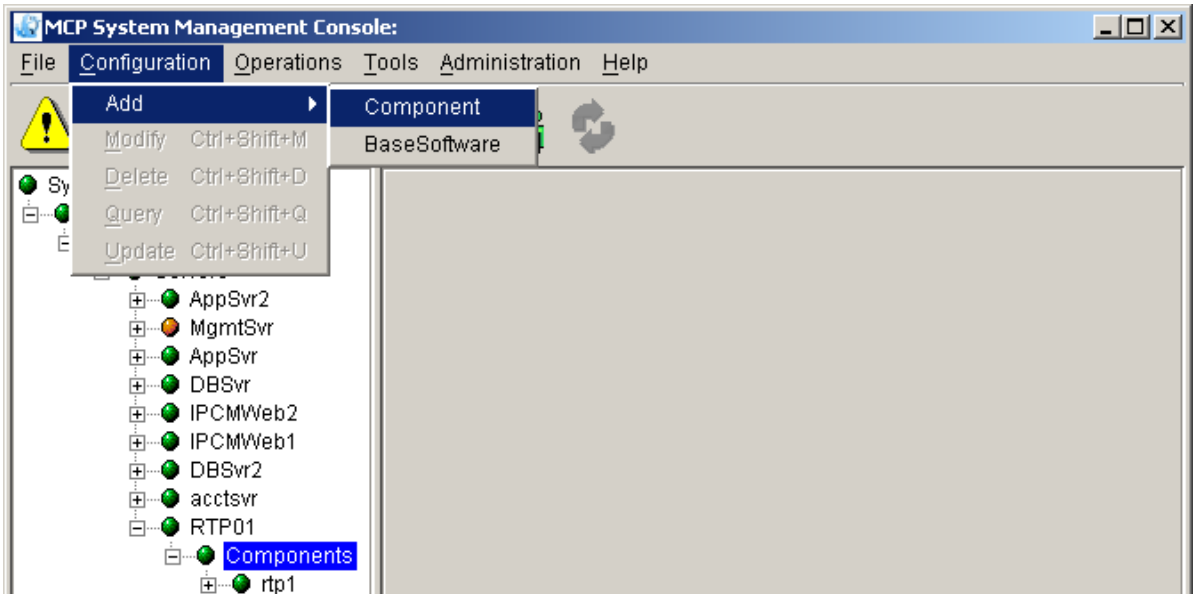
2 From the pop-up menu, select the **Add > Component** command.

Figure 17 Add from the pop-up menu



Note, you may also launch the add command from the pull-down Configuration menu.

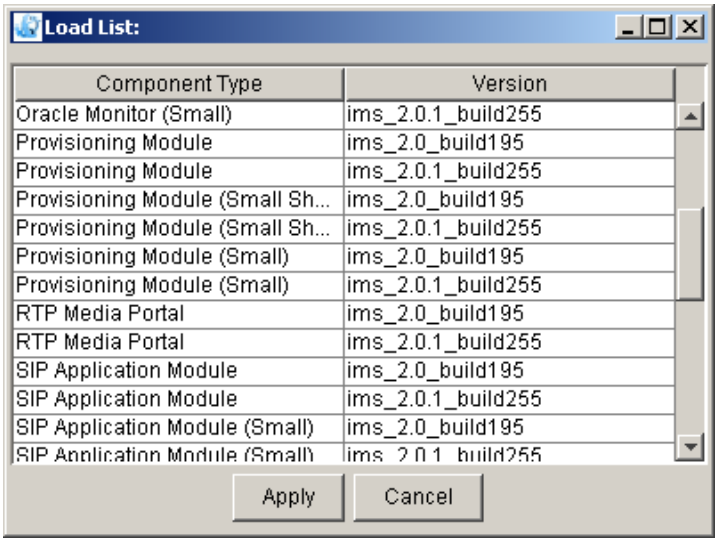
Figure 18 Add from the Configuration menu



After **Add > Component** is selected, you must wait for the load list to retrieve.

3 The Load List window appears with all available component loads (except for those components already deployed to the server).

Figure 19 Load list for adding



4 Select the desired software load version for the RTP Media Portal. Click on the **Apply** button.

5 You will be prompted to configure the RTP Media Portal. For a description of these tabs and properties, please refer to Configuring and managing the RTP Media Portal component on page 43.

6 After entering the appropriate configuration information, enter a label (six characters or less) in the Service Component Name field. This label is the component name that appears in the System tree after deployment. Click on the **Apply** button. A progress screen appears while it deploys

7 When deployment completes, and information dialog message appears to indicate that the action was successful.

Fault management

How this chapter is organized

This chapter is organized as follows:

Network fault management

The system handles network fault management through the reporting of alarms and logs to the Management Module. RTP Media Portal alarms and logs are viewed from the System Management Console. For further details related to alarms, please refer to *MCS 5100 Fault Management*: *Alarm and Log Reference (NN10385-900)*.

Fault tolerance

The RTP Media Portal provides base capabilities that significantly improve the performance and reliability of the system in the event of a fault. These capabilities include:

- Dynamic Pool Registration
  - provides the basic mechanism that ensures resource availability and utilization in the event of a SIP Application Module loss of communications with gateway controllers. This is accomplished through the generation of periodic registration messages (over the control channel) to each of the gateway controllers configured for the RTP Media Portal. This function works in tandem with SIP Application Module redundancy to ensure that RTP Media Portal resources continue to be used in the event of a SIP Application Module failure. The RTP Media Portal is configured to advertise its availability with the Standby SIP Application Module. This configuration enables the Standby SIP

Application Module to immediately begin utilization of the RTP Media Portal for session requests whenever a failure condition occurs on the Active SIP Application Module.

- Idle Session Detection
  - enables the RTP Media Portal to detect and recover media resources associated with idle media sessions. This basic capability enables the system to recover resources as well as maintain capacity and performance.
- Media Survivability
  - enables the RTP Media Portal to allow media sessions to survive (through to session completion) in the absence of control signaling from the SIP Application Module. This capability enables the system to permit media sessions to continue through to completion in the wake of loss of communications with SIP Application Module gateway controllers.
- Host IP Failover
  - provides redundant (active/standby) network connectivity for the RTP Media Portal host card so that if there is a network issue that affects one of the connections then the other connection will assume activity. This functionality enables the RTP Media Portal to maintain control and OAM connectivity in the event of a network failure.
- Shared Resource
  - enables the distribution of RTP Media Portal resources through association with multiple SIP Application Modules. The strategy of distributing media sessions over multiple RTP Media Portals strengthens the network's ability to continue processing sessions in the event of a failure condition. Failures would result in diminished capacity, but not necessarily a service outage since many other RTP Media Portals remain available for SIP Application Modules to utilize.
- Host CPU Recovery
  - provides for media stream survival through a Host CPU failure and subsequent recovery. Upon Host CPU failure, media streams on subtending Media Blades continue to flow undisturbed. During the subsequent Host CPU recovery process, communications are re-established with the Media Blades and available capacity information is retrieved from each of the Media Blades. When the RTP Media Portal resumes

service, if offers the remaining available capacity on the Media Blades for the processing of new sessions.

Fault management procedures

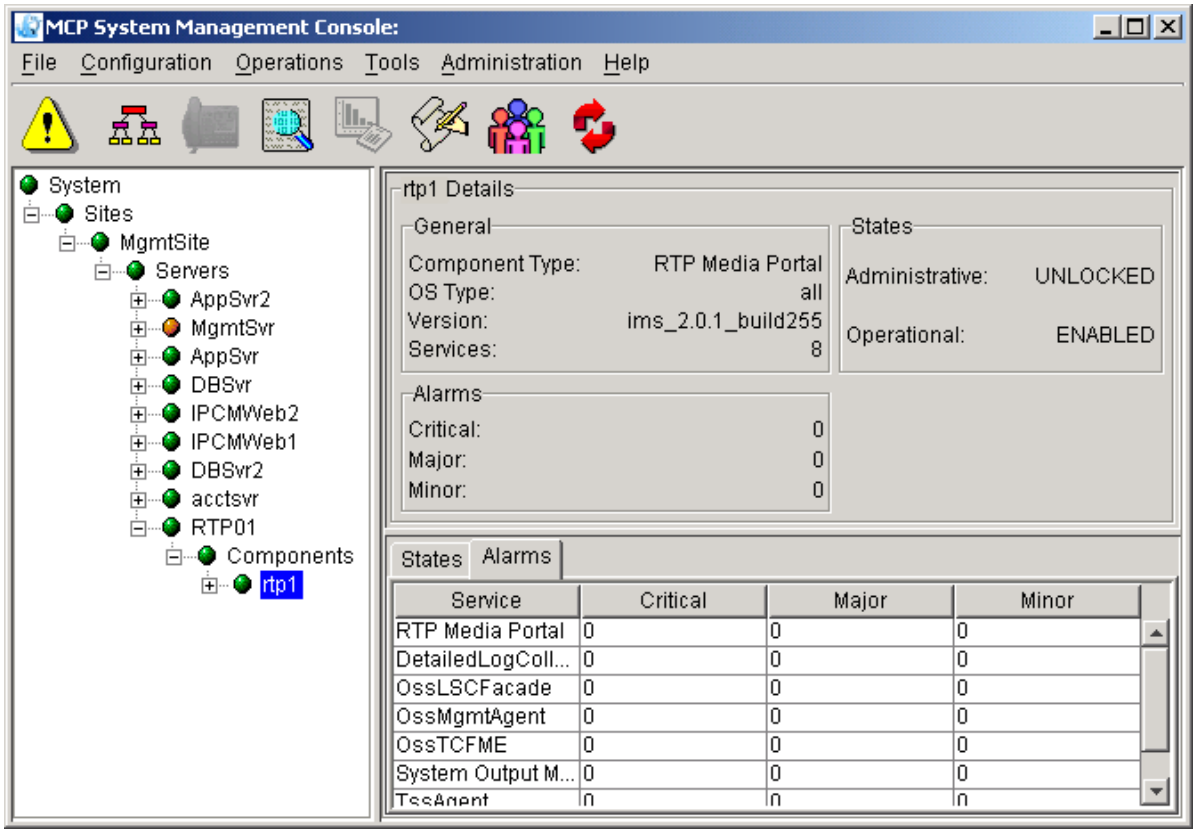
Alarm surveillance

The following procedure lists steps to obtain information regarding alarms.

From the System Management Console

1. In the System tree, select the appropriate RTP Media Portal component.
2. The General Information Area (GIA) pane displays general information, state information, and alarm information for the RTP Media Portal component.
3. Select the Alarm tab within the GIA pane to view the RTP Media Portal services and the severity of any alarm which is raised against it. For alarm severity classification, refer to *MCS 5100 Fault Management: Alarm and Log Reference (NN10385-900).*

Figure 20 Example of viewing alarm information



Clearing an alarm

The following procedure lists steps to clear an alarm.

From the System Management Console

1. In the System tree, select the appropriate RTP Media Portal. component.
2. From the pull-down Tools menu, select **Alarm Browser**.
3. The Alarm Browser window appears displaying the alarms.
4. Double click the alarm row. Information regarding the alarm and necessary steps to clear the alarm appears in the information screen at the bottom of the alarm window.
5. Follow the steps to clear the alarm.

   Note: These steps are defined in RTP Media Portal alarms on page 38.

RTP Media Portal alarms

The following section details how to clear certain alarms that affect the RTP Media Portal. RTP Media Portal alarms are discussed in further detail in *MCS 5100 Fault Management*: *Alarm and Log Reference (NN10385-900)*.

Clearing the RTP101 Alarm (Blade out of service)

1. Verify that you can log in to the media blade from the host card. If successful, the MCP Service Network connection is OK.
2. Once you are logged in to the media blade, verify the media blade can reach the default gateway: Ping the gateway IP address from the media blade. If successful, the network connection is OK.
3. Contact your next level of support with the results of these tests.

Clearing the RTP102 Alarm (RTP Media Portal Out of Service)

1. Verify that you can log in to the host card. If successful, the MCP Service Network connection to the host card is OK.
2. Once you are logged in to the host card, verify that each of the available Media Blades is reachable (ping each media blade).
3. Log in to a Media Blade. Verify the media blade can reach the default gateway: Ping the gateway IP address from the media blade. If successful, the network connection is OK.
4. Repeat for each media blade.
5. Contact your next level of support with the results of these tests.

Clearing the RTP103 Alarm (Best Blade Selection)

1. Verify that you can log in to the media blade from the host card. If successful, the MCP Service Network connection is OK.
2. Once you are logged in to the media blade, verify the media blade can reach the default gateway: ping the gateway IP address from the media blade. If successful, the network connection is OK.
3. Repeat for each media blade.
4. Verify that the correct number of ports have been configured. Use the query tool in the System Management Console.
5. Contact your next level of support with the result of these tests.

Clearing the RTP104 Alarm (Port Usage)

1. Wait for at least two audit cycles to see if the alarm is cleared automatically. An audit cycle has a duration defined by the “Idle Session Audit Period” property.
2. If the alarm persists, the number of available ports per media blade and/or the number of Media Blades in the system must be increased.
3. If it is not possible to increase the number of ports or the number of Media Blades, contact your next level of support.

Clearing the RTP105 Alarm (Host Interface Failure)

1. Ensure network connectivity. Verify interfaces have a good connection to the network (link LED is lit on the host card).
2. If the alarm persists, contact your next level of support.

Informational and communication logs

Logs assist with the maintenance and operation of the RTP Media Portal. Information logs begin with the number nine (RTP**9**06), where communication logs begin with one (RTP**1**08).

- **Host Recovery-Mode Initiated**, RTP906, produced upon recovery of the RTP Media Portal Host application upon discovery of pre-existing media sessions. No action is required.
- **Host Recovery- Mode Completed**, RTP907, produced during the Host CPU recovery process to report the number of connections recovered on a Media Blade. No action is required.
- **Host Recovery-Mode Blade Communication Failure**, RTP108, produced during the Host CPU recovery process reporting the number of Media Blades with which the Host CPU failed to establish

communications. No action is required. An associated alarm is raised for each Media Blade which does not respond.

- **Blade Recovery-Mode Initiated**, RTP909, indicates that the Host CPU was able to re-establish communication with a subtending Media Blade and that the Media Blade is supporting connections. No action is required.
- **Blade Recovery-Mode Completed**, RTP910, indicates the Host CPU was able to re-establish communication with a subtending Media Blade and reports the number of connections the Host CPU was able to restore control over. No action is required.
- **Connection Map Increase Capacity**, RTP911, generated whenever it is necessary for an increase in the size of the Hash Map used to store connection information. This may indicate a need for additional RTP Media Portal resources.
- **Connection Map Increase Capacity Denied**, RTP912, generated whenever a request for an increase in the size of the Hash Map is denied. This indicates the Hash Map has already doubled in size, and prevents unbounded increases in the size of the Connection Map. Report this log to your next level of support.
- **Connection Map Increase Capacity Failed**, RTP913, generated whenever a request for an increase in the size of the Hash Map fails due to some unforeseen software issue. Report this log to your next level of support.
- **Connection Not Found**, RTP914, generated whenever an audit is performed over the Connection Map and a particular connection is not found on the corresponding Media Blade to match the entry in the Connection Map. No action is required.
- **Connection Idle**, RTP915, generated whenever an audit is performed over the Connection Map and a particular connection is not found idle on the corresponding Media Blade. No action is required.
- **Connection Exceeds Long Idle Duration**, RTP916, generated whenever an audit is performed over the Connection Map and a particular connection is found on the corresponding Media Blade which exceeds the Long Idle Duration threshold. No action is required.
- **Connection Exceeds Long Call Duration**, RTP917, generated whenever an audit is performed over the Connection Map and a particular connection is found on the corresponding Media Blade which exceeds the Long Call Duration threshold. No action is required.

- **Failed to Send Signal**, RTP118, generated whenever an attempt to dispatch an outgoing signal fails. No action is required.
- **Failed to Reboot IO Exception**, RTP919, generated whenever a request for reboot of the system fails due to a software request for said reboot. Report this log to your next level of support.
- **No Blades Configured**, RTP920, generated whenever the Media Portal initiates in a state in which no Media Blade information has been configured from the System Management Console. No action is required.
- **Unknown Proxy**, RTP921, generated whenever a request for service is made from an unknown proxy, one which is not datafilled for this Media Portal. No action is required.
- **Unable to Register with Proxy**, RTP922, generated whenever an attempt to send a registration message to a proxy fails. No action is required.
- **Host Interface Status File Problem**, RTP923, generated during a failed attempt to establish a file handle for the interface status file, read from it, or it does not exist. Verify the host IP failover setting is properly set from the System Management Console. Report this log to your next level of support.

System logs

System logs are discussed in detail in *MCS 5100 Fault Management*: *Alarm and Log Reference (NN10385-900)*.

Configuration management

How this chapter is organized

This chapter is organized as follows:

Tools and utilities

Deployment and configuration of the RTP Media Portal is performed by the System Management Console and the Provisioning Client. Please refer to *MCS 5100 System Management Console User Guide (NN10273-111)* and *Provisioning Client User Guide (NN42020-132)* for more information.

The add operation on the System Management Console allows administrators to initially deploy and configure the RTP Media Portal component. The query operation is used for viewing configuration property values. The modify operation is used for changing the values of configuration properties any time after initial deployment.

Configuring and managing the RTP Media Portal component

This section provides procedures relevant to configuring the RTP Media Portal component.

Deploying the RTP Media Portal server

For information regarding how to deploy and configure an RTP Media Portal server, please refer to *MCS 5100 System Management Console User Guide (NN10273-111)*.

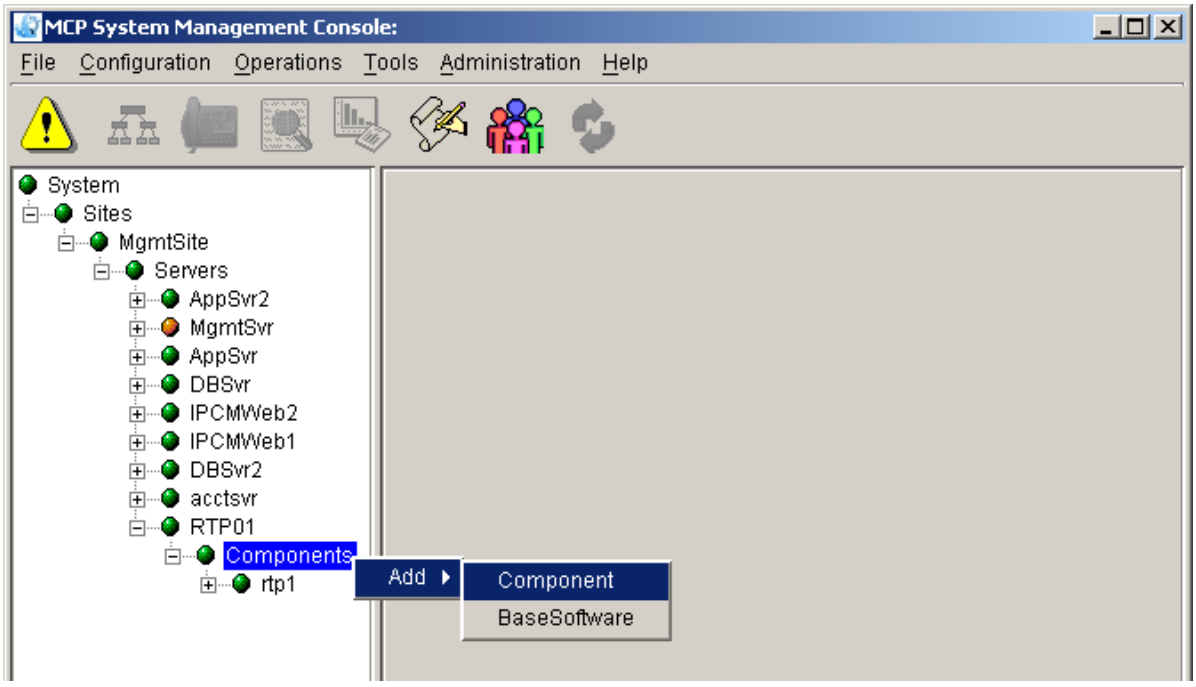
Adding the RTP Media Portal component

This procedure assumes that the server on which the RTP Media Portal will be deployed, has already been configured. For example, Figure 21, Add from the pop-up menu, on page 44 shows the RTP Media Portal component being deployed onto the previously configured RTP Media Portal server.

From the System Management Console

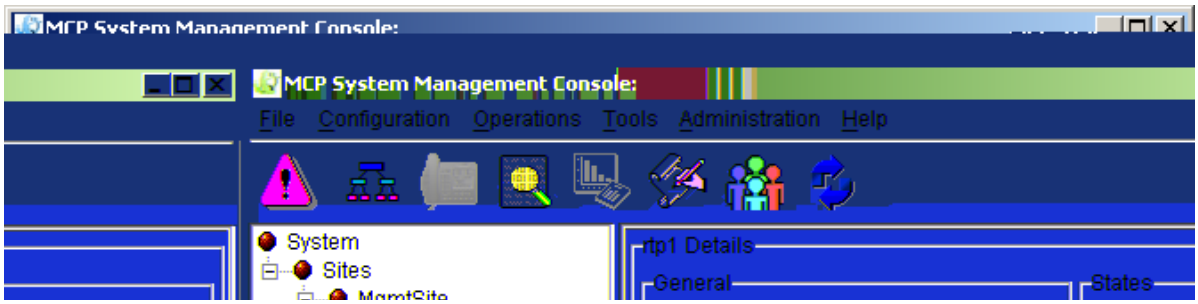
1. In the System tree, right-click **Components** under the appropriate RTP Media Portal server.
2. From the pop-up menu, select the **Add > Component** command.

Figure 21 Add from the pop-up menu



Note: You may also launch the add command from the pull-down Configuration menu.

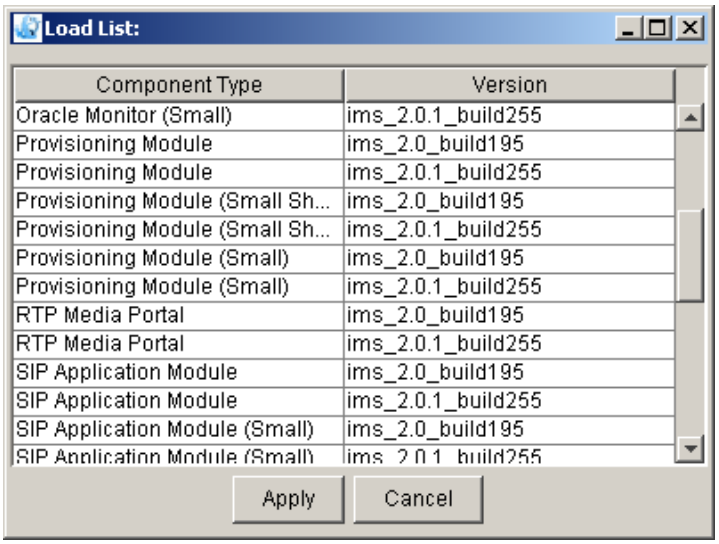
Figure 22 Add from the Configuration menu



After **Add > Component** is selected, you must wait for the load list to retrieve.

3 The Load List window appears with all available component loads (except for those components already deployed to the server).

Figure 23 Load list for adding



4 Select the desired software load version for the RTP Media Portal. Click on the **Apply** button.

5 You will be prompted to configure the RTP Media Portal. For a description of these tabs and properties, please refer to Configuration tabs and properties on page 47.

6 After entering the appropriate configuration information, enter a label (six characters or less) in the Service Component Name field. This label is the component name that appears in the System tree after deployment. Click on the **Apply** button. A progress screen appears while it deploys.

7 When deployment completes, and information dialog message appears to indicate that the action was successful.

Querying or modifying RTP Media Portal configuration properties

Use the following procedure to query or modify the configuration properties for the RTP Media Portal component.

From the System Management Console

1 In the System tree, find the appropriate RTP Media Portal component to be queried or modified.

2 To query the configuration properties, right-click the root level RTP Media Portal component and select **Query**.

Figure 24 Query RTP Media Portal configuration properties

The Query RTP Media Portal window displays the properties. However, no configuration changes are permitted in the window.

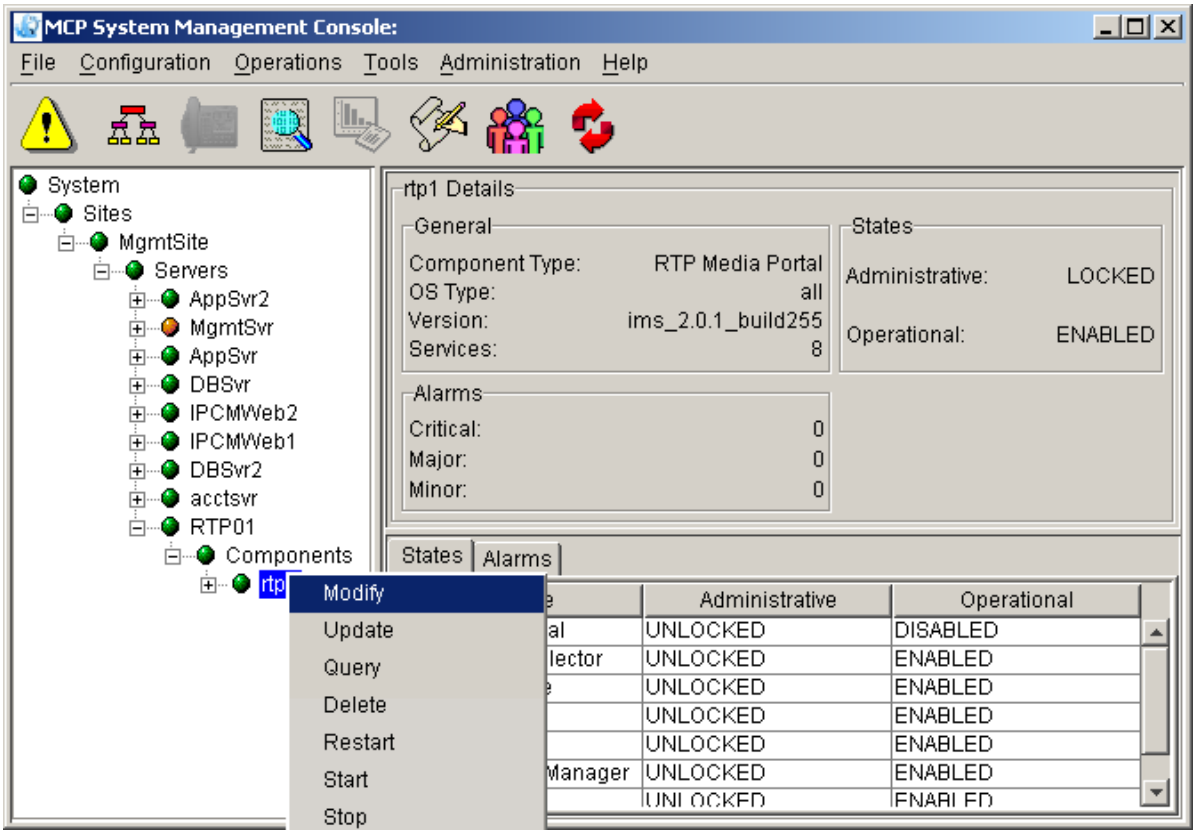
3 To modify the configuration properties of an RTP Media Portal component, do the following:

a Right-click the root level RTP Media Portal component and click **Shutdown** to shutdown and eventually lock the component so configuration properties can be modified.

Note: After completing the shutdown, the RTP Media Portal component's media resources are no longer available for new sessions and its state is automatically transitioned to LOCKED once all existing in-progress sessions are released.

b Once the RTP Media Portal component is LOCKED, right-click the root level RTP Media Portal component and click **Modify**.

Figure 25 Modify RTP Media Portal configuration properties

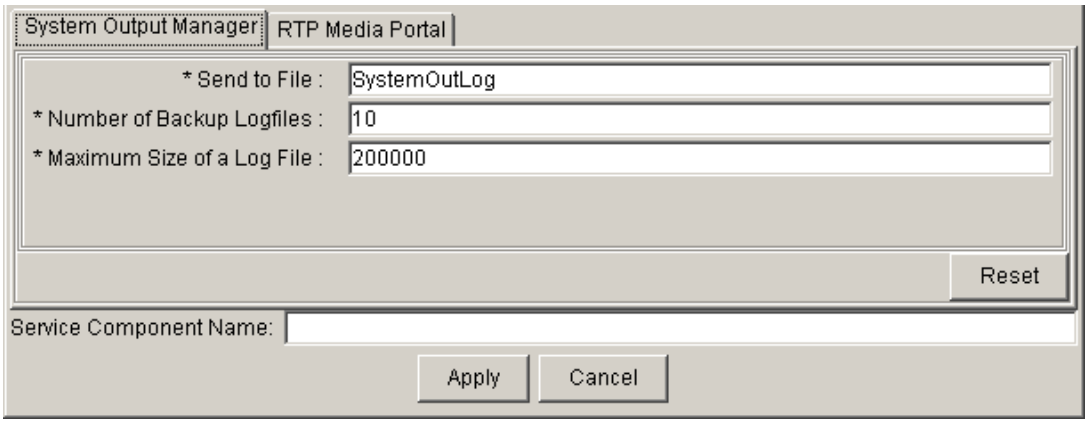


c Modify the properties as required and click **OK**. For information on the configuration properties, please refer to Configuration tabs and properties on page 47.

Configuration tabs and properties

The following figure shows the configurable properties of the System Output Manager tab.

Figure 26 System Output Manager tab



The following table details the configurable properties of the System Output Manager tab.

Table 1 System Output Manager tab configurable properties

Configuration Property	Format	Description
Send to File	Type: String Range: Null, 1-500 characters Default: SystemOutLog	Name of file that additional detailed logs should be sent to.
Number of Backup Logfiles	Type: Integer Range: N/A Default: 10	Number of logfiles that should be kept.
Maximum Size of a Log File	Type: Integer (bytes) Range: 200000-2147483647 Default: 200000	Maximum size of the log file in bytes. When this size is reached, the log file is rotated.

The following figures show the configurable properties of the RTP Media Portal tab.

Figure 27 RTP Media Portal tab (1 of 3)

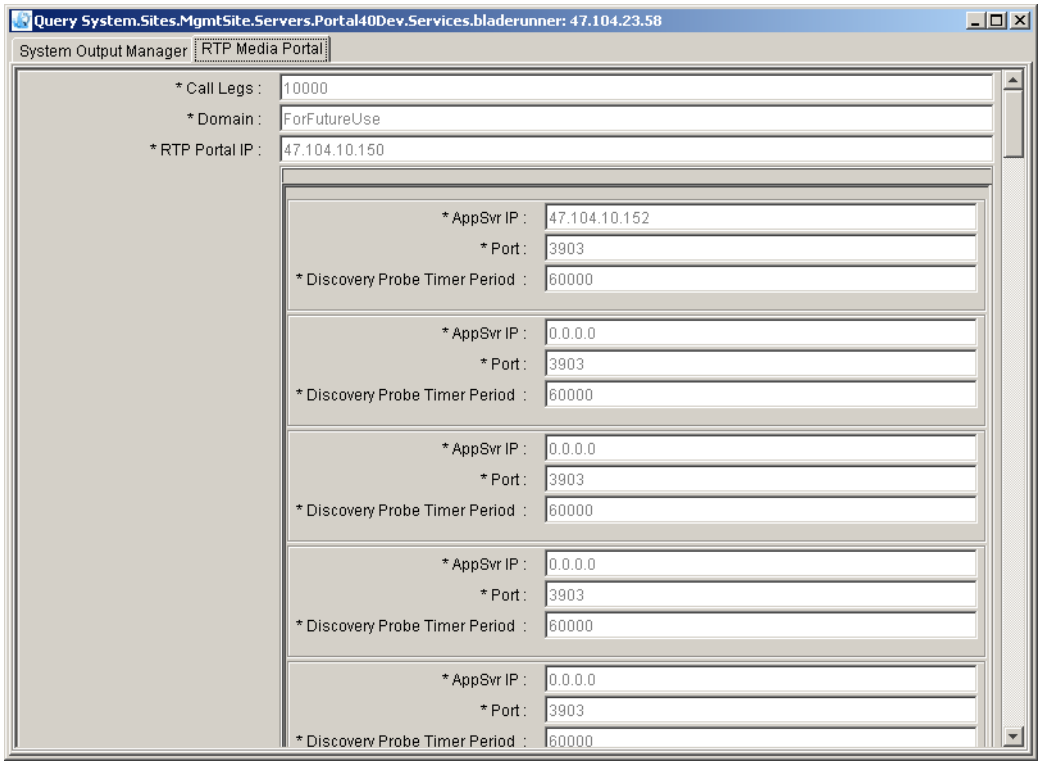


Figure 28 RTP Media Portal tab (2 of 3)

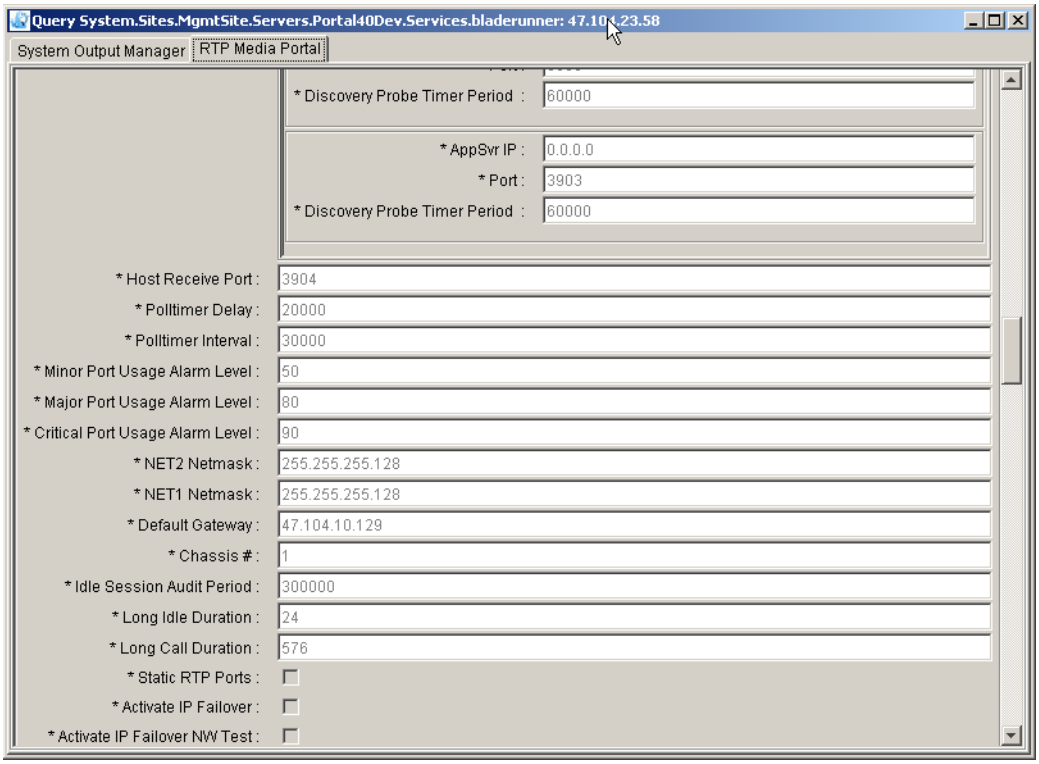
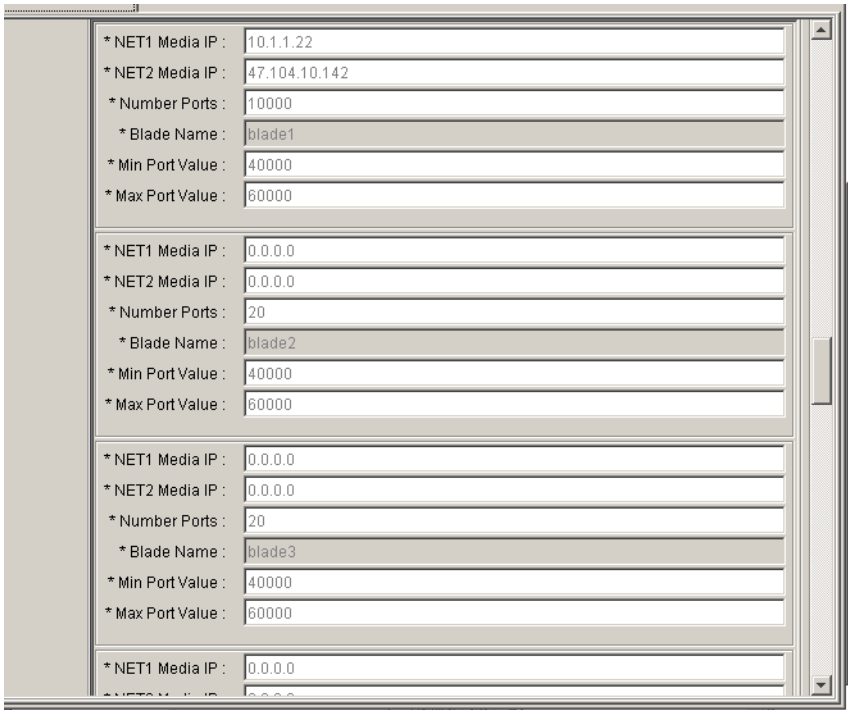


Figure 29 RTP Media Portal tab (3 of 3)



The following table details the configurable properties of the RTP Media Portal tab.

Table 2 RTP Media Portal tab configurable properties (Sheet 1 of 8)

Configuration property	Format	Description
Call Legs	Type: String Range: 4096-MaxInt Default: 4096	Defines the bounds for internal data structures. This value is not normally changed. Default recommended.
Domain	Type: String Range: 1-20 characters Default: <ForFutureUse>	Domain in which the RTP Media Portal will operate. Not currently used.
(Sheet 1 of 8)		

Table 2 RTP Media Portal tab configurable properties (Sheet 2 of 8)

Configuration property	Format	Description
RTP Portal IP	Type: String Range: 7-15 characters Default: 0.0.0.0	MCP Service Network IP Address of the RTP Media Portal Host. Identifies a specific Host. **Note:** This value must be unique.
AppSvr IP	Type: String Range: 7-15 characters Default: 0.0.0.0	MCP Service Network IP Address of SIP Application Module to which this RTP Media Portal is assigned.
Port	Type: String Range: 1025-65535 Default: 3903	Port on which the SIP Application Module is listening for MPCP messaging from the RTP Media Portal. It must match the associated setting on the SIP Application Module. **Note:** The use of the default value for this property is highly recommended.
Discovery Probe Time Period	Type: String Range: 0-3600000 Default: 60000	Controls the frequency (in milliseconds) of MPCP registration messages (RSIPs) sent from the RTP Media Portal to the SIP Application Module in the absence of MPCP messaging from the SIP Application Module.
Host Receive Port	Type: String Range: 1025-65535 Default: 3904	Port on which the RTP Media Portal listens for MPCP messaging from the SIP Application Module. **Note:** The use of the default value for this property is highly recommended.

(Sheet 2 of 8)

Table 2 RTP Media Portal tab configurable properties (Sheet 3 of 8)

Configuration property	Format	Description
Polltimer Delay	Type: String Range: 0-65535 Default: 20000 milliseconds	Time span (in milliseconds) required for startup and initialization of the Media Blades. The Host waits this period of time before attempting to contact the Media Blades. **Note:** The use of the default value for this property is highly recommended.
Polltimer Interval	Type: String Range: 0-65535 Default: 65000 milliseconds	Interval (in milliseconds) at which the Host periodically polls the Media Blades to ensure they are still available. (Periodic checks that make sure the media blade is still up.) **Note:** The use of the default value for this property is highly recommended.
Minor Port Usage Alarm Level	Type: Percent Range: 0-100 Default: 50	The percent usage at which the number of ports used on an RTP Media Portal (over all Media Blades) causes a minor RTP104/RTP105 alarm.
Major Port Usage Alarm Level	Type: Percent Range: 0-100 Default: 80	The percent usage at which the number of ports used on an RTP Media Portal (over all Media Blades) causes a major RTP104/RTP105 alarm.
Critical Port Usage Alarm Level	Type: Percent Range: 0-100 Default: 90	The percent usage at which the number of ports used on the an RTP Media Portal (over all Media Blades) causes a critical RTP104/RTP105 alarm.
(Sheet 3 of 8)		

Table 2 RTP Media Portal tab configurable properties (Sheet 4 of 8)

Configuration property	Format	Description
Net1 Netmask	Type: IP address Range: N/A Default: 255.255.255.0 **(Used for the Media Blades, not for the host card.)**	The Net1 Netmask is the netmask used for routing on the network that is reachable by the NET1 interface on the media card. This is only used in dual-network configurations.
Net2 Netmask	Type: IP address Range: N/A Default: 255.255.255.0 **(Used for the Media Blades, not for the host card.)**	The Net2 Netmask is the netmask used for routing on the network that is reachable by the NET2 interface on the media card.
Default Gateway	Type: IP Address Range: N/A Default: 0.0.0.0 **(Used for the Media Blades, not for the host card.)**	The Default Gateway is the gateway router to the rest of the world (the default route). **Note:** If this value is not configured, the RTP Media Portal will be unable to provide service. The RTP Media Portal will only provide service if the Media Blades can communicate with the specified Default Gateway.
Chassis #	Type: String Range: 0-255 Default: 1	Chassis identifier used to identify a specific CPX8216T chassis. This information is used by configuration scripts to synchronize RTP Media Portal configuration across multiple CX8216T chassis. Must be unique per chassis. Must match the Chassis # assigned to the Media Blades during the staging of the RTP Media Portal hardware.
(Sheet 4 of 8)		

Table 2 RTP Media Portal tab configurable properties (Sheet 5 of 8)

Configuration property	Format	Description
Idle Session Audit Period	Type: String Range: 0-3600000 Default: 300000 (ms)	The period of the audit that runs to detect idle media sessions on the media blade.
Long Idle Duration	Type: String Range: 0-65535 Default: 24	This represents the maximum amount of time that a RTP Media Portal resource may remain validly idle. This has units of number of Idle Session Audit Periods.
Long Call Duration	Type: String Range: 0-65535 Default: 576	This represents the maximum amount of time that an RTP Media Portal resource may remain active in a media session. This has units of number of Idle Session Audit Periods.
Static RTP Ports	Type: Boolean Range: true/false Default: false	Boolean indicating whether the RTP Media Portal should perform static fixed port allocation/management, or dynamic randomized port allocation/management. **Note:** When this parameter is selected, the media blade's configuration parameter "Number Ports" is disregarded and all ports in the range from “Min Port Value” to “Max Port Value” are allocated for usage. All even-numbered ports in the specified range are used for RTP streams and the odd-numbered ports are used for RTCP streams.

(Sheet 5 of 8)

Table 2 RTP Media Portal tab configurable properties (Sheet 6 of 8)

Configuration property	Format	Description
Activate IP Failover	Type: Boolean Range: true/false Default: true	Enables the RTP Media Portal Host to monitor the status of the MCP Service Network Interface and react accordingly. This basic capability enables the system to maintain service availability in the wake of MCP Service Network failures. Whenever an RTP Media Portal Host detects that it is having problems with its MCP Service Network interface, the Host switches to the other available MCP Service Network interface. **Note:** There are two tests associated with the activation of Host IP Failover: a carrier sense test and an optional network (ping) test. Upon activation of Host IP failover, the carrier sense test is automatically provided. Enabling of the optional network test is controlled by the “Activate IP Failover NW Test” configuration parameter. Enabling the optional network test will generate a periodic ping to the default gateway on the MCP Service Network which was configured on the Host during installation and commissioning.
Activate IP Failover NW Test	Type: Boolean Range: true/false Default: false	This configuration parameter is associated with the “Activate IP Failover” configuration parameter. Please refer to **Note** in description of the “Activate IP Failover” configuration parameter for details.

(Sheet 6 of 8)

Table 2 RTP Media Portal tab configurable properties (Sheet 7 of 8)

Configuration property	Format	Description
Net1 Media IP	Type: IP Address Range: 7-15 characters Default: 0.0.0.0	The Net1 Media IP address of this particular media blade. Repeated for each media blade.
Net2 Media IP	Type: IP Address Range: 7-15 characters Default: 0.0.0.0	The Net2 Media IP address for this particular media blade. Repeated for each media blade.
Number Ports	Type: Positive Integer Range: 0-65535 Default: 20	Defines the size of the media resource pool for each media blade. The value is specified by System Engineering and based on call types and traffic patterns. The default should change in accordance with the factors described above.
Blade Name	Type: Text Range: blade1-blade16 Default: blade1, blade 2, etc.	String describing this particular media blade. Repeated for each media blade. **Note:** This field is not configurable.
Min Port Value	Type: Positive Integer Range: 0-65535 Default: 40000	Minimum port range value.
Max Port Value	Type: Positive Integer Range: 0-65535 Default: 60000	Maximum port value.

(Sheet 7 of 8)

Table 2 RTP Media Portal tab configurable properties (Sheet 8 of 8)

Configuration property	Format	Description
InsertPortalWhenAnyBFW	Type: Boolean Range: true/false Default: false	If set to false, a RTP Media Portal is not used for calls when two Firewall clients are in the same Domain. If set to true, a RTP Media Portal is used when one or both clients in the same Domain are behind a Firewall.
LocationBasedInsertRules	Type: Boolean Range: true/false Default: false	If set to true, RTP Media Portal Location Based Insertion Rules and user-defined Routability Groups are activated.
(Sheet 8 of 8)		

Accounting management

Functional description

The RTP Media Portal does not perform accounting management. However, an indication that an RTP Media Portal component was used during a session is provided in the accounting records.

For more information on accounting, please refer to *MCS 5100 Accounting Module Basics (NN10279-111)*.

Performance management

Functional description

RTP Media Portal performance is monitored through the System Management Console by viewing Operational Measurements (OMs). For more information on RTP Media Portal OMs and the viewing of these OMs, please refer to *MCS 5100 System Management Console User Guide (NN10273-111)*.

Security and administration

How this chapter is organized

This chapter is organized as follows:

Security overview

One function of the RTP Media Portal is to secure the media interface to the MCP Services Network. Securing the media layer is achieved through a combination of methods at the network level and the component (RTP Media Portal) level.

Network level security functions

At the network level, media layer security is achieved by the randomization of the IP addresses/ports used for multimedia sessions and utilization of NAPT (Network Address Port Translation) technology to obscure the network topology of the MCP Services Network.

Media Blade (IP address) randomization

When a multimedia session requests resources, the RTP Media Portal selects an appropriate Media Blade to host the session. Media blade selection determines the specific IP address that will be made available to the media streams for the session.

During the selection of a Media Blade, the port usage of each Media Blade is queried to determine the number of available ports for each. The Media Blade which has the most available ports is selected. This method of selection provides randomization and helps distribute the session load across the Media Blades.

Port randomization

When the RTP Media Portal is deployed, each Media Blade is configured with a pool of ports containing a specific number of ports in a specific range based on configuration data (“Number Ports”, “Min Port Value”, “Max Port Value”, respectively). For more information on these configuration properties, refer to Table 2, RTP Media Portal tab configurable properties, on page 51.

As multimedia sessions are initiated, a port is chosen from the port pool associated with the selected Media Blade. For non-static port configurations (i.e. “Static RTP Ports” is configured to be “false”), when a multimedia session completes, their associated ports are deallocated from the pool and new replacement ports are allocated to the pool. The deallocation of used ports and allocation of replacement ports provides randomization in the port pools for the Media Blades.

NAPT function

In order to obscure the MCP Services Network topology, the RTP Media Portal uses the NAPT functionality to secure the multimedia sessions so that there is no leakage of topology information.

This is achieved by maintaining a list of media ports (NAPT table) which are being used within active multimedia sessions. Only packets which arrive on these active ports are processed. Packets which arrive on non-active ports are rejected and logged as potential problems.

RTP Media Portal component level security functions

The RTP Media Portal component also contributes to system security by opening and closing media ports only in response to requests from the SIP Application Module (which has pre-authenticated such requests) and by rejecting any unauthorized packets arriving on an active connection.

Authenticated requests

All requests to manipulate the media resources on the RTP Media Portal originate from the SIP Application Module. The SIP Application Module ensures that all requests are made by, or made to, a valid service subscriber. In this way, the SIP Application Module effectively authenticates all requests.

In addition, the portion of the RTP Media Portal which processes these requests to manipulate the media resources resides safely within the MCP Services Network.

Packet filter/firewall

As packets are received, the RTP Media Portal analyzes each packet to ensure the following:

- The data format is RTP/RTCP/UDP, as indicated by the session description. All other packet types are discarded and logged as problems.
- The source/destination addresses match the expected source/destination addresses indicated in the session description. Packets that do not have a matching source/destination address are discarded and logged as potential problems.
- The source/destination ports match the expected source/destination ports indicated in the session description. Packets that do not have a matching source/destination port are discarded and logged as potential problems.

User administration

Basic administrative tasks for the RTP Media Portal are covered in the Upgrade, Configuration, and Fault sections of this document. Other basic administrative tasks related to the System Management Console are covered in *MCS 5100 System Management Console User Guide (NN10273-111).*

Appendix A: Backup and recovery

How this chapter is organized

This chapter is organized as follows:

Backup and restore

Prerequisites

The following prerequisites are required for a RTP Media Portal backup or restore.

- Remote DDS4 tape drive. The tape drive does not need to be within the MCP Service Network, but it must be attached to a Solaris* machine that is visible to the server conducting the backup.
- DDS4 tape, in the remote tape drive. For Universal Serial Bus (USB) drives, use a 20 GB tape. For SCSI drives, use a 12 GB tape.
- Live 100Mbps Ethernet connection.
- IP address of the tape server.
- Full duplex mode. Ensure all nodes involved have their network interface set to full duplex mode. This includes the server being backed up or restored, the tape server, and any intermediate node in the network being traversed. All MCP Servers should be set to

Auto Negotiate so that they too will respond in full duplex mode. Failure to set the mode to full duplex will result in restore times that are ten times normal.

- For restore operation, server address information is required.
- For restore operation, the *Linux Recovery CD* is required. The *Linux Recovery CD* is the Linuxcare Bootable Toolbox CD-ROM, available at: http://www.linuxcare.com/bootable_cd.

When connecting a USB tape drive to the server, perform the following:

- Log in as **root** to the server where the tape drive is being connected or disconnected.
- Type the command **/etc/init.d/volmgt stop** and press **Enter**.
- Connect or remove the USB tape drive. When connecting the tape drive, use port 0.
- If connecting the tape drive, type the command **/etc/init.d/volmgt start** and press **Enter**.
- If connecting the tape drive, turn it on.

If there is an error installing a USB tape drive, refer to Error installing USB tape drive on page 83 for instructions to correct the problem.

System access

Backup

To establish connection to the RTP Media Portal, access is obtained through a Secured Shell (SSH). Note, if this connection is used and the SSH session dies, the backup operation will die as well.

Restore

During a system restore, the server's operating system is executing in a limited capacity. Therefore, access must be through the server's console port (via the serial port).

Duration

Determine how much data will be involved in the backup or restore operation in order to estimate the length of time required for the

operation. Use Unix commands to determine the size of the following partitions:

- /
- /boot
- /var
- /IMS
- /usr

Backup requires approximately 20 minutes per GB when using a USB tape drive, and approximately eight minutes per GB for a SCSI tape device.

Restore requires approximately 35 minutes per GB, regardless of which type of tape drive is used.

Estimates for backup and restore are rough as there are multiple factors that can affect the time required to complete the operation. As backups can be performed while the machine is live, system activity may slow the operation. If a backup or restore occurs across a network, network traffic can affect the time required to complete the operation.

Remote tape drive set up

A remote tape drive is required. The following procedure outlines the steps necessary to properly set up the remote tape drive if it is on an MCP Server.

If the remote tape drive is NOT on a MCP Server, you may skip this procedure. However, the user must ensure the remote shell operations from the server to be backed up are enabled on the remote tape drive server.

From the terminal server

1. As the MCP Server has to access the tape drive on the remote host, make sure it has the proper access to that host.
2. Log in as **sysadmin** to the server with the tape drive.
3. Enable the execution of remote shell commands.

   sudo /usr/local/bin/mcp_enable_remote_sh.pl <MCP_Server_IP> <Enter>

   where **<MCP_Server_IP>** is the Portal Host IP address.
4. From the Portal, log in as **root**.
5. Verify access to the remote host has been set correctly.

rsh -l sysadmin <Tape_Server_IP> df -k <Enter>

where **<Tape_Server_IP>** is the IP address of the remote host with the tape drive.

6 Output appears on screen, indicating the target system is correctly set for the restore operation. In not, contact your next line of support before continuing.

Backup to remote tape drive

The following procedure lists steps to backup the RTP Media Portal to tape. As the restore operation is manual, no logs are generated.

Ensure the remote tape drive has been set up correctly before proceeding with the backup. For more information, refer to Remote tape drive set up on page 69.

From a terminal server

1 Label the DDS4 tape with the RTP Media Portal name and the date of backup. Insert the tape into the tape drive of the server acting as backup host.

2 Log in as **sysadmin** to the RTP Media Portal.

3 Initiate the backup.

sudo /usr/local/bin/mcp_backup.pl <Tape_Server_IP> <Enter>

where **<Tape_Server_IP>** is the IP address of the selected tape host where the tape drives resides.

The backup operation will take a while to complete. If the backup requires more than one tape, the system will prompt the user to insert additional tapes as needed.

4 When the backup is complete, remove the tape from the tape drive. Store the tape in a safe, dry location.

5 Review the backup script **mcp_backup.pl** to ensure the backup was successful. The log file is store in the directory **/home/sysadmin/bkup_restore**, and the filename is **mcp_backup.pl.log.<dayTimeStamp>**. Where **<dayTimeStamp>** is YYYY_MM_DD_HH:MM:SS.

6 From the remote host, disable remote access.

sudo /usr/local/bin/mcp_disable_remote_sh.pl <Enter>

Restore

The following procedure lists steps to restore the RTP Media Portal from tape. Ensure the remote tape drive has been set up correctly

before proceeding with the restore. For more information, refer to Remote tape drive set up on page 69.

From the terminal server

1 Prepare the system for restore. For instructions, refer to Prepare system for restore on page 71.

2 Partition the hard drive. For instructions, refer to Partition the hard drive on page 74.

3 Initiate the rollback. For instructions, refer to Initiate restore on page 78.

Prepare system for restore

The following provides instruction to prepare the system for rollback.

From the terminal server

1 From the terminal server, prevent the console session from timing out due to inactivity during the restore process.

TMOUT=0;export TMOUT; <Enter>

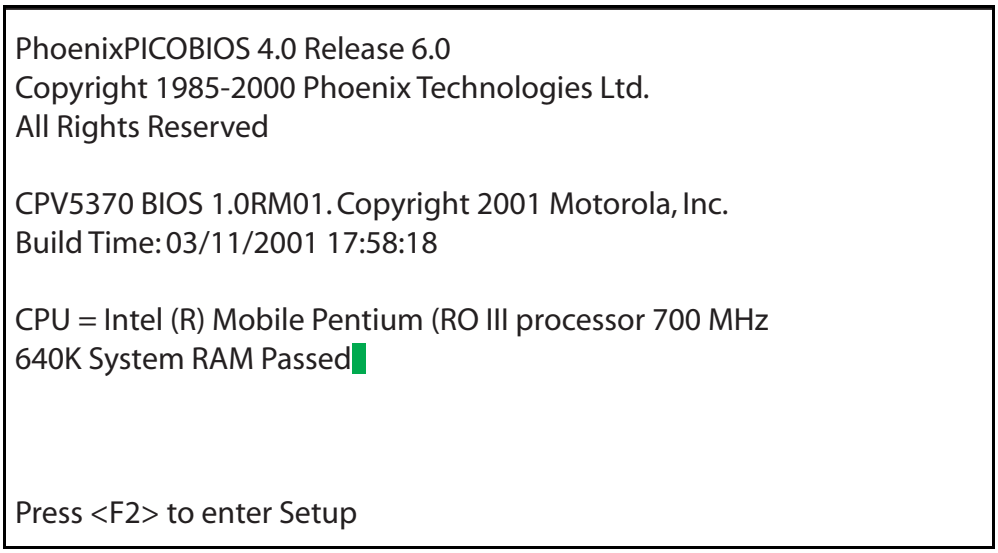
2 Select the proper DDS4 tape, the most recent backup tape for the server. Insert the tape into the tape drive of the tape host server.

3 Reboot the Portal by pressing the reset button on the front of the Host card.

4 From the terminal server session, press **F2** to enter the BIOS Setup.

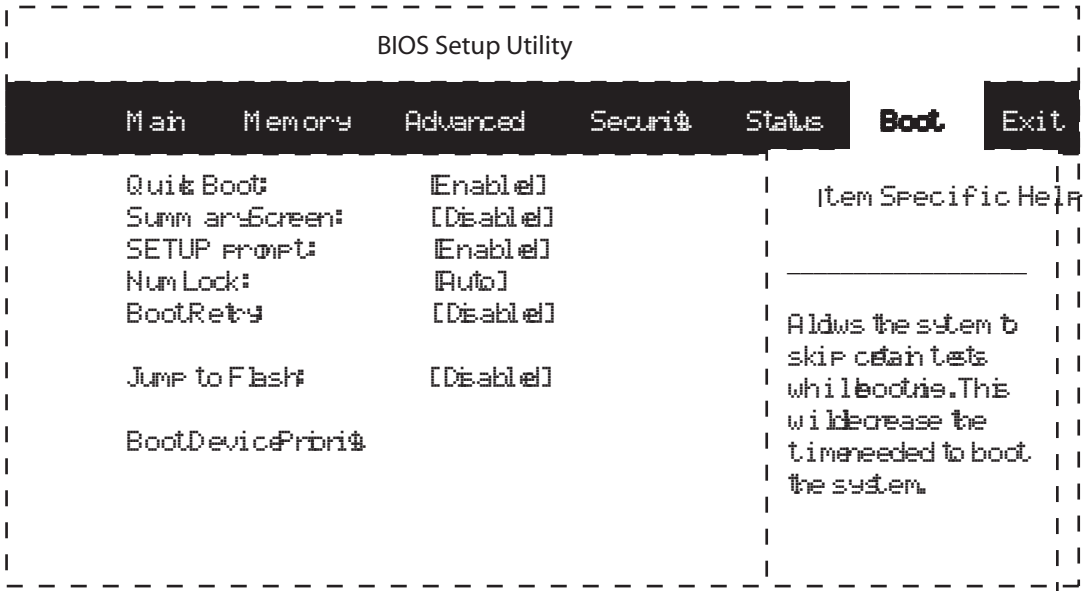
Use the escape sequence **<Shift+Esc+OQ>** instead of **F2** when logged in from a terminal server.

Figure 30 Enter BIOS Setup screen



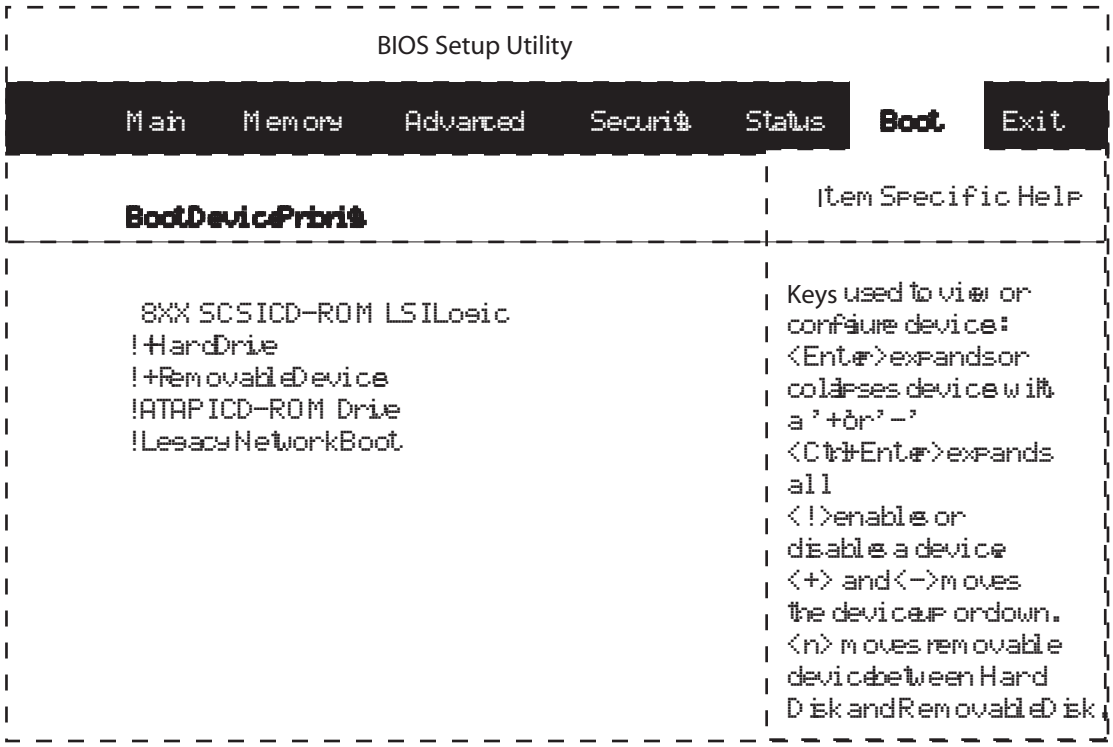
5 From the BIOS Setup Utility screen, use the arrow keys to move to the **Boot** menu.

Figure 31 BIOS Setup: Boot menu



6 Use the arrow keys to select **Boot Device Priority**, then press the **Enter** key to display the Boot Device Selection menu.

Figure 32 BIOS Setup: Boot Device Selection menu



7 Use **Item Specific Help** to disable all devices except the SCSI CD-ROM drive. For each device to be disabled, use the arrow keys to select the device, then type an exclamation mark (**!**) to disable it.

8 Press the **Esc** key four times. Then press **Enter** when prompted to save the configuration. The system will reboot from the CD-ROM drive.

9 Insert the *Linux Recovery CD* into the RTP Media Portal CD-ROM drive.

10 Press the reset button on the Linux server. This will cause the Linux server to reboot from the recovery CD-ROM.

11 Log in as **root**, password **rescue**.

12 Verify that access to the tape server has been set correctly.

rsh -l sysadmin <Tape_Server_IP> df -k <Enter>

where **<Tape_Server_IP>** is the name of the remote tape server host.

Output appears on screen, indicating the target system is correctly set for the restore operation. In not, contact your next line of support before continuing.

Partition the hard drive

The following table lists **fdisk** commands used to partition the hard drive.

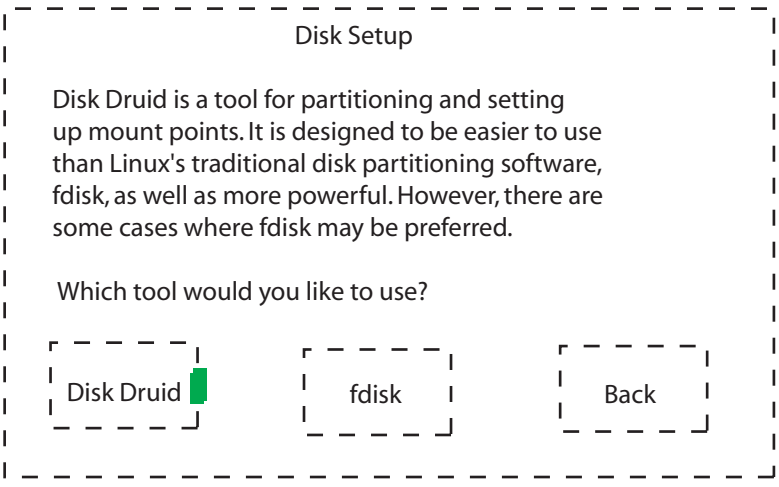
Command	Description
m	Display a list of available commands.
n	Create a new partition.
p	Print the current partition table.
d	Delete a partition.
t	Change the type of a partition.
w	Write the partition table and exit **fdisk**.

The following procedure assumes a 40 GB hard drive, and includes partition recommendations.

From the terminal server

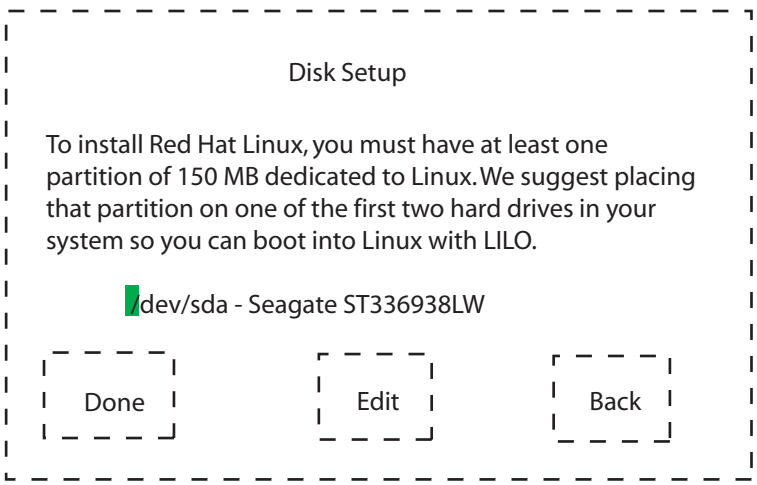
1 Select the **fdisk** option under **Disk Setup** to partition the hard drive.

Figure 33 Red Hat: Disk Setup screen



2 Select the only highlighted hard disk present, and select **edit**.

Figure 34 Red Hat: Edit hard disk



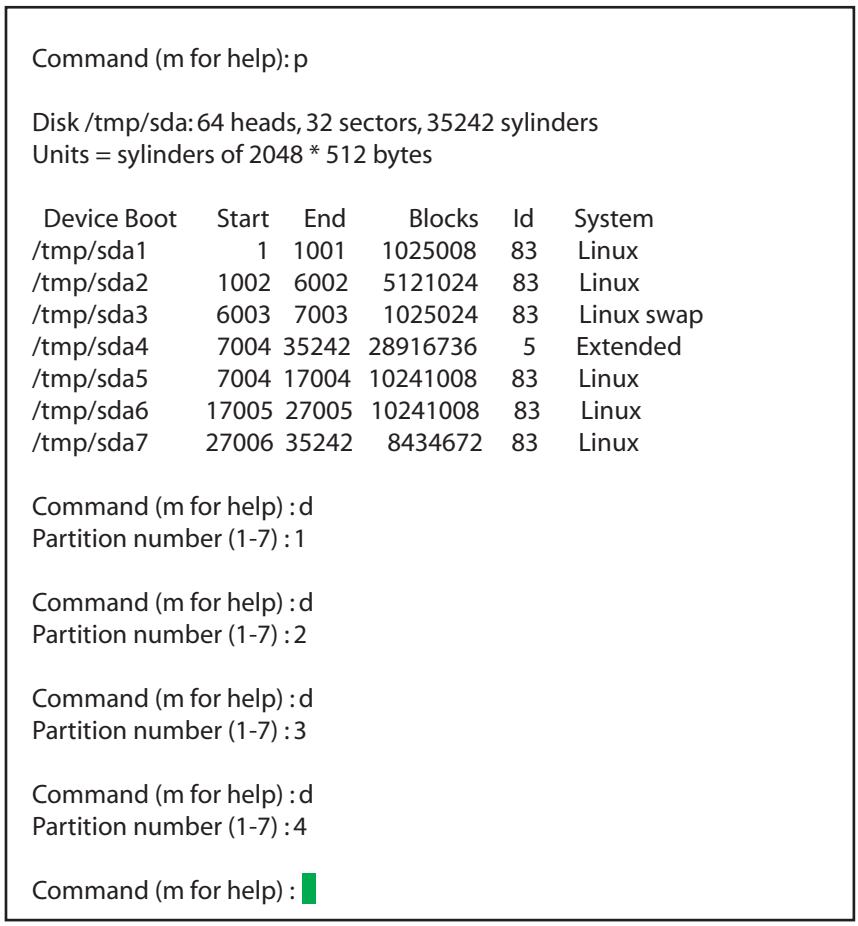
3 Type **p** and press **Enter** to display existing partitions. If any exist, type **d** to delete them. For example to delete partition 1, type **d**, press **Enter**, type **1**, press **Enter**.

After deleting existing partitions, type **w** and press **Enter** to save changes to the partition table.

4 Create the first partition. Type **n** and press **Enter** to create a partition. To note the primary partition, type **p** and press **Enter**, then type **1** and press **Enter**. Press **Enter** to accept the default beginning block, and type **+1000M** and press **Enter** for the size.

```
Command (m for help):n
Command action
   e    extended
   p    primary partition (1-4)
p
Partition number (1-4): 1
First cylinder (1-35242, default 1): <Enter>
Using default value 1
Last cylinder or +size or +sizeM or +sizeK (1-35242,
default 35242): +1000M
```

Figure 35 Red Hat: Create partition screen



5 Create the second partition. Type **n** and press **Enter** to create a partition. To note the primary partition, type **p** and press **Enter**, then type **2** and press **Enter**. Press **Enter** to accept the default beginning block, and type **+5000M** and press **Enter** for the size.

```
Command (m for help):n
Command action
   e    extended
   p    primary partition (1-4)
p
Partition number (1-4): 2
First cylinder (1002-35242, default 1002): <Enter>
Using default value 1002
Last cylinder or +size or +sizeM or +sizeK
(1002-35242, default 35242): +5000M
```

6 Create the third partition.Type **n** and press **Enter** to create a partition. To note the primary partition, type **p** and press **Enter**,

then type **3** and press **Enter**. Press **Enter** to accept the default beginning block, and type **+1000M** and press **Enter** for the size.

```
Command (m for help):n
Command action
   e    extended
   p    primary partition (1-1)
p
Partition number (1-4): 3
First cylinder (6003-35242, default 1): <Enter>
Using default value 6003
Last cylinder or +size or +sizeM or +sizeK
(6003-35242, default 35242): +1000M
```

7 Change the partition type for the third partition. Type **t** and press **Enter**, type **3** and press **Enter**, then **type 82** and press **Enter**.

```
Command (m for help):t
Partition number (1-7): 3
Hex code (type L to list codes): 82
Changed system type of partition 3 to 82 (Linux swap)
```

8 Create the fourth partition. Type **n** and press **Enter,** type **e** and press **Enter**, then type **4** and press **Enter**. Press **Enter** to accept the default beginning block, then press **Enter** again to accept the default for the last block.

```
Command (m for help):n
Command action
   e    extended
   p    primary partition (1-1)
e
Partition number (1-4): 4
First cylinder (7004-35242, default 7004): <Enter>
Using default value 7004
Last cylinder or +size or +sizeM or +sizeK
(7004-35242, default 35242): <Enter>
```

9 As the drive may only have four main partitions, the fourth partition will hold partitions five through seven. Type **n** and press **Enter** to create the fifth partition. Press **Enter** to accept the default beginning block, then type **+10000M** and press **Enter** for the size.

```
Command (m for help):n
First cylinder (7004-35242, default 7004): <Enter>
Using default value 7004
Last cylinder or +size or +sizeM or +sizeK
(7004-35242, default 35242): +10000M
```

10 To create the sixth partition type **n** and press **Enter**. Press **Enter** to accept the default beginning block, then type **+10000M** and press **Enter** for the size.

```
Command (m for help):n
First cylinder (17005-35242, default 17005): <Enter>
Using default value 17005
Last cylinder or +size or +sizeM or +sizeK
(17005-35242, default 35242): +10000M
```

11 To create the seventh partition type **n** and press **Enter**. Press **Enter** to accept the default beginning block, then press **Enter** again to accept the default value for the last block.

```
Command (m for help):n
First cylinder (27006-35242, default 27006): <Enter>
Using default value 27006
Last cylinder or +size or +sizeM or +sizeK
(27006-35242, default 35242): <Enter>
```

12 Type **p** and press **Enter** to view the final partition table. Example output:

```
Disk /tmp/sda: 64 heads, 32 sectors, 35242 cylinders
Units= cylinders of 2048 * 512 bytes

Device Boot Start  End  Blocks    Id    System
/tmp/sda1     1   1001  1025008   83     Linux
/tmp/sda2   1002  6002  5121024   83     Linux
/tmp/sda3   6003  7003  1025024   82   Linux swap
/tmp/sda4   7004  35242 28916736   5    Extended
/tmp/sda5   7004  17004 10241008  83     Linux
/tmp/sda6   17005 27005 10241008  83     Linux
/tmp/sda7   27006 35242 8434672   83     Linux
```

13 Press **w** and press **Enter** to save changes.

14 Press **q** and press **Enter** to exit.

Initiate restore

The following provides instructions to initiate the restore.

From the terminal server

1 Format the partitions.

mke2fs /dev/sda1 <Enter>
mke2fs /dev/sda2 <Enter>
mkswap /dev/sda3 <Enter>
mke2fs /dev/sda5 <Enter>
mke2fs /dev/sda6 <Enter>
mke2fs /dev/sda7 <Enter>

2 Locate the NIC driver.

modprobe eepro100 <Enter>

3 Activate the network interface.

ifconfig eth0 <IP_address> netmask <net_mask> up <Enter>

where **<IP_address>** is the IP address of the Portal Host card, and **<net_mask>** is the network address mask for this network segment.

4 Route the IP address of the MCP Service Network's gateway.

route add default gw <gateway> <Enter>

where **<gateway>** is the IP address of the network gateway for the subnet.

5 Create a mountpoint for the root partition.

mkdir /a <Enter>

6 Restore the boot partition.

mount /dev/sda1 /a <Enter>
cd /a <Enter>
restore rfv sysadmin@<tape_server_IP>:/dev/rmt/0cn <Enter>
rm -f restoresymtable <Enter>
cd .. <Enter>
umount /dev/sda1 <Enter>

7 Restore the root partition.

mount /dev/sda2 /a <Enter>
cd /a <Enter>
restore rfv sysadmin@<tape_server_IP>:/dev/rmt/0cn <Enter>
rm -f restoresymtable <Enter>
cd .. <Enter>
umount /dev/sda2 <Enter>

8 Restore the var partition.

mount /dev/sda5 /a <Enter>
cd /a <Enter>
restore rfv sysadmin@<tape_server_IP>:/dev/rmt/0cn <Enter>
rm -f restoresymtable <Enter>
cd .. <Enter>
umount /dev/sda5 <Enter>

9 Restore the usr partition.

mount /dev/sda6 /a <Enter>
cd /a <Enter>
restore rfv sysadmin@<tape_server_IP>:/dev/rmt/0cn <Enter>
rm -f restoresymtable <Enter>
cd .. <Enter>
umount /dev/sda6 <Enter>

10 Restore the IMS partition.

mount /dev/sda7 /a <Enter>
cd /a <Enter>
restore rfv sysadmin@<tape_server_IP>:/dev/rmt/0cn <Enter>
rm -f restoresymtable <Enter>
cd .. <Enter>
umount /dev/sda7 <Enter>

11 Run the Linux boot loader

mount /dev/sda2 /a <Enter>
cd /a <Enter>
mount /dev/sda1 boot <Enter>

12 Set the current system root to the new partition.

chroot /a <Enter>

13 Set the boot kernel.

lilo <Enter>

14 Reboot the RTP Media Portal by pressing the reset button on the front of the Host Card.

15 While rebooting, hold down the **F2** key to enter BIOS to force the system to boot from the hard drive. Follow steps step 5 through step 8 from the procedure Prepare system for restore on page 71 to reverse settings.

16 Remove the *Linux Recovery CD* from the CD-ROM drive.

17 Remove the tape from the tape drive. Return it to a safe, dry location.

18 From the remote host, disable remote access.

sudo /usr/local/bin/mcp_disable_remote_sh.pl <Enter>

Error scenarios

This section provides information regarding error scenarios that could occur when a backup or restore operation is in progress. For RTP Media Portal, log files are located in the directory **/home/sysadmin/bkup_restore/**

Invalid IP address

If an invalid IP address is entered, an information message is displayed. Example output:

```
/usr/local/bin/mcp_backup.pl 47.47.47.46
 no answer from 47.47.47.46
 10:22:27 ERROR: System, 47.47.47.46, could not be
pinged
 10:22:27 Remote Backup verification failed, aborting
backup process
 Logs are written to
/export/home/sysadmin/bkup_restore/mcp_backup...
```

For restore operations, if an invalid IP address is entered after the **ufsrestore** command has been executed, an information message is displayed. Example output:

```
ufsrestore rfsv sysadmin@47.47.47.47:/dev/rmt/Ocn 1
Fri Feb 6 17:06:14 CST 2004

48.48.48.48: Connection timed out
before Fri Feb 6 17:11:03 CST 2004
```

Connection to remote tape server is lost

If a RTP Portal looses connection to the tape drive during a backup, the system will display error messages on screen.

Example output:

```
<47.47.47.48:20976,47.104.157.20:16001,108076965965
5,3,1080343335125,54>:
Established ---> Destroying
<47.47.47.48:20976,47.104.157.20:16001,108076965965
5,3,1080343335125,54>:
Destroying ---> Destroyed
<47.47.47.48:20976,47.104.157.20:16001,108076965965
5,4,null,null>:
Inactive ---> Reset
<47.47.47.48:20976,47.104.157.20:7001,1080769659655
,2,1080343397775,63>:
Established ---> Destroying
<47.47.47.48:20976,47.104.157.20:7001,1080769659655
,2,1080343397775,63>:
Destroying ---> Destroyed
<47.47.47.48:20976,47.104.157.20:7001,1080769659655
,5,null,null>:
Inactive ---> Reset
```

```
DUMP: Lost connection to remote host.
```

As the **mcp_backup** script “hangs”, type **Ctrl-C** to abort. (To kill the process from another session type **=> kill -9 <pid>**.)

Tape drive failure
If something happens to the tape drive during a backup, an information message is displayed. Example output:

```
DUMP: write: I/O error
DUMP: write error 8320 blocks into volume 1
DUMP: Do you want to restart?: (“yes” or “no”)
```

Answer **no** to this prompt. The script will terminate, and another backup can be started. An information message is displayed on screen:

```
DUMP: The ENTIRE dump is aborted.
19:29:15
************************************************
19:29:15 An error occurred during one (or more) dump
commands=>

19:29:15 DUMP: Do you want to restart? (“yes” or
“no”) DUMP: the ENTIRE dump is aborted.

19:29:15 DO NOT USE THIS BACKUP - a RESTORE USING THIS
BACKUP WILL FAIL
19:29:15 Fix the associated problem, and perform
another backup
19:29:15
************************************************
19:29:15 Dump command(s) failed. Aborting backup.
Logs are written to
/home/sysadmin/bkup_restore/mcp_backup.pl.log
```

Restoring from multiple tapes
When restoring from multiple tapes, if a user presses **Enter** before inserting the next tape into the tape drive, the restore process must be restarted.

To recover, continue to press **Enter** until a “Read error” is displayed. For example, the following shows output generated when a user incorrectly presses **Enter** before tape 2 is inserted, then presses **Enter** again to obtain the “Read error” message:

```
Mount volume 2
then enter volume name (default: /dev/rmt/0cn)

Mount volume 3
then enter volume name (default: /dev/rmt/0cn)

Read error while restoring
./me/loads/pool9/Files/B/UAS06.zip.bLfCbwYvd5YvveYt
continue? [y n] n
Verify volume and initialize maps
Media read error: I/O error
rest*: No such file or directory
12:49:35 Failed to Restore /IMS/imssipdb directory,
aborting restore process
Logs are written to
/export/home/sysadmin/bkup_restore/mcp_recover.pl.
log.2004_03_24.12:49:35
```

Error installing USB tape drive

If there is an error installing a USB tape drive, reboot the server and log in as **root**. Then type the command **shutdown -y -g0 -i6** and press **Enter**.

Recovery

The following procedures include instructions to replace the CPU host card and task processor.

Replacement of CPU host card

If a CPV5370 fails, calls in progress stay up but call control is lost. Calls cannot be controlled again, nor can any new calls be set up on that Portal until the CPV5370 has been replaced and the new CPV5370 is in service.

If a CPU host card fails, replace the bad card with a new one. Follow steps in BIOS configuration of the CPV5370 Host Card on page 90 to make the appropriate BIOS changes to the new card.

Replacement of task processor

If the RTP Media Portal MCPN765 fails, all calls set up on that blade are lost at the time of the failure and cannot be recovered. Replace the bad card, and perform the following initialization procedures. This procedure requires a special cable to configure the BIOS of the card.

From the terminal device

1 Set up the MCPN765 Card. For more information, refer to Setting up the MCPN765 I/O Card on page 104.

2 Configure the MCPN765 Card. For more information, refer to Configuring the MCPN765 I/O Card on page 108.

3 Complete the installation. For more information, refer to Complete the installation on page 84.

Complete the installation

This section provides instruction for completing the installation of the MCPN765 Card.

From the terminal device

1 Change directory.

cd /etc <Enter>

2 Edit the bladeEtherAddres file. Change the MAC address for the 765 that was replaced. The top of the file contains comments detailing the file format.

Note on MCPN765 blades (when paired with the PIMC-0101 transition module), NET2 is used for the MCP Service Network interface and corresponds to CLUN 13/DLUN 0, while NET1 is used for another network interface (either a Public Network or subnet of the MCP Service Network) and corresponds to CLUN 0/DLUN 0.

3 Move to the **Edit** menu to save the file and exit the editor.

Appendix B: RTP Media Portal installation

How this chapter is organized

This chapter is organized as follows:

Prerequisites

This chapter provides instruction for installing a new RTP Media Portal. It is assumed that hardware is already assembled as follows:

- MCPN765 I/O blades are installed in front slots 1-6 for Domain A, and slots 11-16 for Domain B.
- PIMC-0101 765 transition modules are installed in rear slots 1-6 for Domain A, and slots 11-16 for Domain B.
- CPV5370 host blades are installed in front slot 7 for Domain A, and slot 9 for Domain B.
- 5370 transition modules are installed in rear slot 7 for Domain A, and slot 9 for Domain B.
- CPX8216T HSC/BR hot swap controllers are installed in front slot 8 for Domain B, and slot 10 for Domain A.
- Hard drives and CD-ROM drives are installed in the front peripheral bay.
- Floppy drives are installed in rear peripheral bay.

Installing the RTP Media Portal software consists of placing the required packages on the hard drive of the host blade. As the host blade is the only blade in the system that has a hard drive, it is also configured

to allow I/O blades to boot and mount their file systems over the network.

The complete base system can be installed in approximately 30 minutes.

IMPORTANT: The installation procedures must be followed separately for each side if two Portals are installed in the same chassis.

The following is required for an installation:

- Chassis and peripherals
  - — One Motorola CPX8216T high availability compact PCI which is divided into two domains (A and B), each running independent media portals.
  - — One SCSI hard drive per domain, minimum 40Gb.
  - — One SCSI CD-ROM per domain.
  - — One 3.5” floppy drive per domain.
  - — One Motorola CPX8216T HSC/BR hot swap controller per domain.
- Host Blade
  - — One Motorola CPV5370 per domain.
  - — One Motorola 5370 transition module per domain.
- I/O Blades
  - — Up to six MCPN765 per domain.
  - — One PIMC-0101 transition module for each MCPN 765.
- Other hardware
  - — VT100-compatible terminal device for console access to the host and I/O blades.
- Base software
  - — Red Hat 6.2 installation CD (disc 1)
  - — RTP Media Portal installation CD
- Required information
  - — IP address information: one address per host blade and one or two media addresses per I/O blade.
  - — IP address(es) of timeservers.
  - — MAC (ethernet) addresses of all I/O blades (two addresses per blade). Addresses can be found on labels affixed to the blade or

from blade NVRAM (use the **niot ;h** command to get the blade Ethernet addresses from the bug prompt).

- RTP Portal chassis number
- Gateway router address, may be different between host(s) and media card(s).
- Netmasks for all assigned IP addresses
- Root password for host(s)
- Password for user “nortel”
- Time zone

Network deployment

The RTP Media Portal may be configured as a dual- or single-network. For backwards compatibility, the media cards may be connected to separate networks. For new deployments, the recommended approach is to deploy the RTP Media Portal in a single-network configuration.

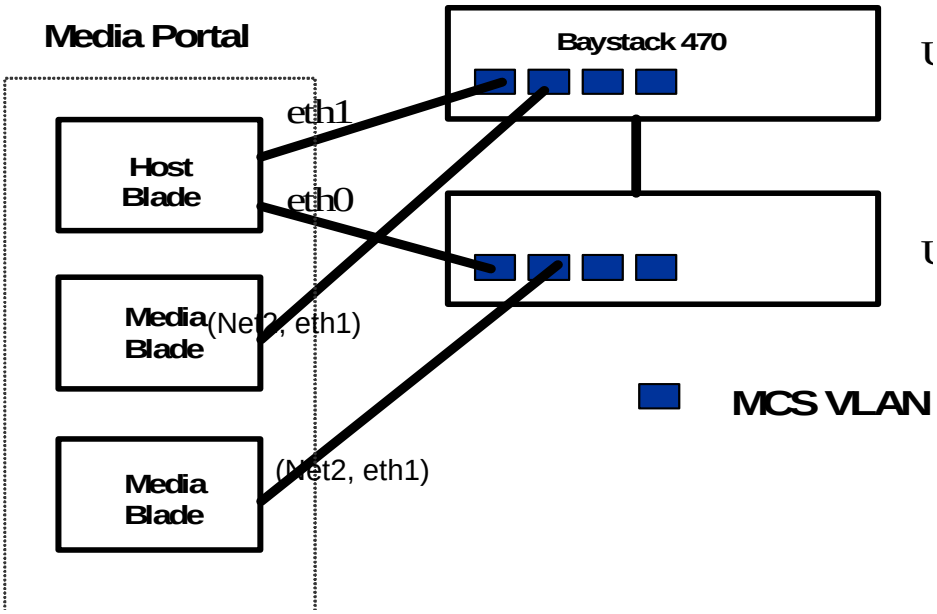
Single-network deployment

Single-network configuration requires both the host and Media Blades of the Portal to be assigned the same subnet. Media Portals may be deployed centrally with the core MCS components, or dispersed remotely to provide geographic proximity.

The two network interfaces of the host blade (eth0 and eth1) are grouped together as a redundant pair. These two interfaces are connected to different switch units. For the Media Blades, only one of the available network interface (NET2, eth1) is utilized. In order to provide high availability in this simplex mode, one half of the Media Blades are connected to switch unit 0, and the other half to switch unit 1.

A single-network deployment is shown Figure 36 on page 88.

Figure 36 RTP Media Portal single-network deployment



The below table details the usage of the physical port for single-network deployment.

Label	BIOS device number	Linux interface name	Usage
MCPN 765 I/O Card Ethernet port usage			
NET1	CLUN 0/DLUN 0	eth0	unused
NET2	CLUN 13/DLUN 0	eth1	MCS VLAN
CPV5370 Host Card Ethernet port usage			
1	N/A	eth0	MCS VLAN
2	N/A	eth1	MCS VLAN

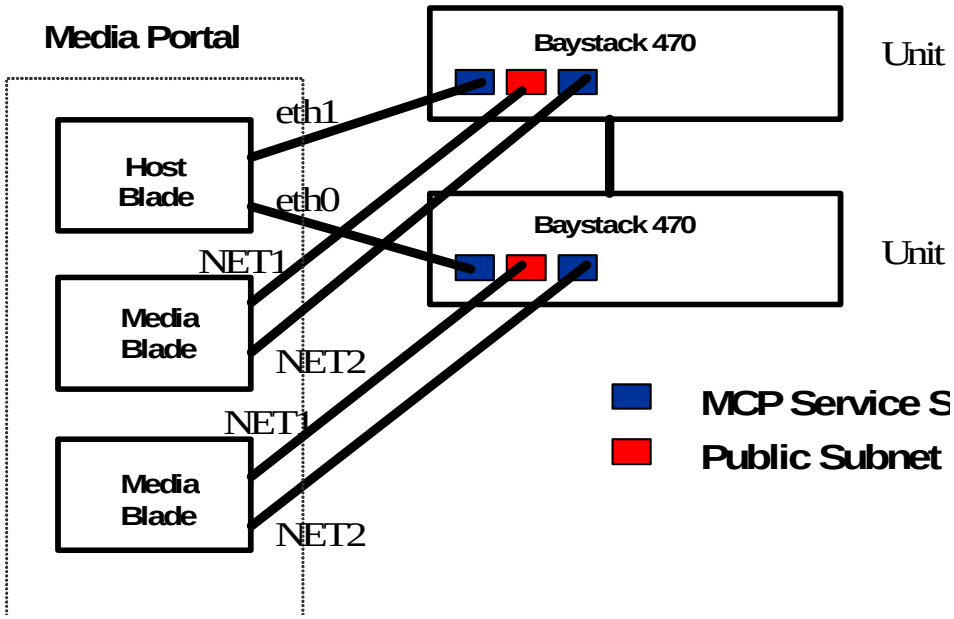
Failure to use the ports as described will result in a non-operational RTP Media Portal.

Dual-network deployment

For the dual-network configurations, the host is connected to the MCP Service Network. The Media Card has one interface connected to the MCP Service Network (NET2) and one to the other network (NET1), either a public network or a subnet of the MCP Service Network. The

two interfaces on the host are used in an active, standby mode and there is no interface redundancy on the media cards as each connects to a separate network. This configuration is depicted in Figure 37 on page 89.

Figure 37 Dual-network deployment



The below table details the usage of the physical port for dual-network deployment.

Label	BIOS device number	Linux interface name	Usage
MCPN 765 I/O Card Ethernet port usage			
NET1	CLUN 0/DLUN 0	eth0	Public
NET2	CLUN 13/DLUN 0	eth1	MCS Service
CPV5370 Host Card Ethernet port usage			
1	N/A	eth0	MCS Service
2	N/A	eth1	MCS Service

Failure to use the ports as described will result in a non-operational RTP Media Portal.

Installing RTP Media Portal

This section outlines steps to install the RTP Media Portal.

From the terminal console

1. Establish BIOS settings for the CPV5370 Host Card. For details, refer to BIOS configuration of the CPV5370 Host Card on page 90.
2. Install the base operating system, Red Hat 6.2. For details, refer to Installing the base Red Hat system on page 93 and Partitioning the hard drive on page 94
3. Complete the installation. For details, refer to Completing the installation on page 96.
4. Install the RTP Media Portal packages. For details refer to Installing the RTP Media Portal packages on page 101.
5. Configure the Network Time Protocol. For details, refer to Configuring Network Time Protocol on page 103.

BIOS configuration of the CPV5370 Host Card

This procedure provides instruction for BIOS settings. While many of the factory default settings are acceptable, a few require changes. If you are not certain the factory settings are in effect, reset all values to default from within the BIOS set up under the **Exit** menu.

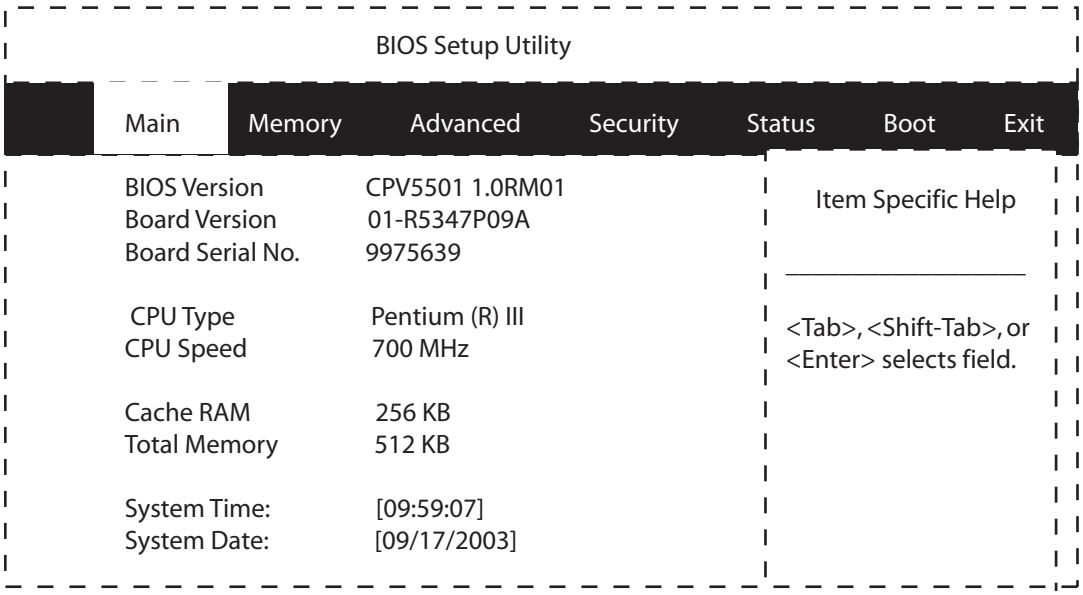
From the terminal console

1. Create a console connection to COM1 (A) on the front panel of the host CPU card.

   A connection to COM1 is only used during the initial power up procedures. Once the BIOS configuration is set, the user must remove the serial cable from COM1 and connect the Terminal Server to cable COM2 on the transition module.
2. As the system is powering on, hold down the **F2** key to enter BIOS set up. The CPV5370 Card ships from the factory with serial port settings 19,200 baud, 8/n/1.

   If you do not see output on screen, it may be necessary to reseat the CPV5370 card and press the Reset button on the front panel.

Figure 38 BIOS Setup Utility screen



3 From the **Advanced** menu, move to **IDE Configuration** and press **Enter**.

4 Verify, or change, the values on screen to match the values listed below. Leave all other values as default.

```
Local Bus IDE adapter: [Disabled]
Large Disk Access Mode: [DOS]
SMART Device Monitoring: [Disabled]
Primary Master: [NONE]
Primary Slave: [NONE]
Secondary Master: [NONE]
Secondary Slave: [NONE]
```

5 Press **Esc** twice to return to the **Advanced** menu.

6 Move to **PCI Configuration** and press **Enter**.

7 Verify, or change, the values on screen to match the values listed below.

```
Default Primary Video Adapter: [AGP]
On-Card Ethernet 1: [Enabled]
Ethernet 1 Connection: [Rear]
Ethernet 1 Option ROM: [Disabled]
On-Card Ethernet 2: [Enabled]
Ethernet 2 Connection: [Rear]
Ethernet 2 Option ROM: [Disabled]
```

8 Move to the **HA configuration** sub-menu and press **Enter**.

9 Set the **HA Config** value to **Enabled**. Also, set the Domain that is being configured to **Enable**, and **Disable** for the other domain. CPU in slot 7 is Domain A, and CPU in slot 9 is Domain B.

Example for Domain A, the Host Card in slot 7:

```
HA Config [Enabled]
Domain A [Enabled]
Domain B [Disabled]
```

10 Press **Esc** twice to return to the **Advanced** menu.

11 Move to **Remote Console** and press **Enter**.

12 Verify, or change, the values on screen to match the values listed below. Leave all other values as default.

```
COM Port: [COM B]
Serial port B: [Enabled]
Base I/O address: [2F8]
Interrupt: [IRQ 3]
Baud Rate: [9600]
Console Type: [VT100]
Flow Control: [None]
Screen Lines: [25]
Active After Post: [On]
```

13 Press **Esc** twice to return to the **Advanced** menu.

14 From the **Boot** menu, move the cursor to **Boot Device Priority** and press **Enter**.

15 Ensure the system boots in the following order:

```
8XX SCSI CD-ROM LSI Logic
+Hard Drive
! +Removable Devices
! ATAPI CD-ROM Drive
! Legacy Network Boot
```

Place an exclamation mark (!) beside the appropriate devices to disable them.

16 Press the **Esc** key to return to the main menu.

17 Move to the **Security** menu to set control access to the BIOS settings. Unauthorized BIOS access enables any Linux security to be circumvented.

18 Set up the BIOS supervisor password. Ensure the password on Boot option is disabled.

19 Move to the **Exit** menu to save changes and exit the BIOS set up. The system will reboot.

20 While the system is rebooting, quickly change the console connection from COM1 to COM2. Use the escape sequence **<Esc><Shift>OQ** to enter the BIOS set up screen again.

If you do not see output on the terminal, make sure the terminal is set to **9600/8/n/1** and reset the CPV5370 card to try again.

21 When prompted, enter the supervisor password to ensure the password was correctly set and is using COM2 as the console port.

22 Insert the Red Hat 6.2 installation CD in the CD-ROM drive for the domain (the top CD-ROM drive is Domain A).

23 Press the **Esc** key to exit BIOS without making any changes. The system will reboot.

24 Remove the serial cable from COM2, and connect the serial cable from the Terminal Server to that port.

Installing the base Red Hat system

The RTP Media Portal uses the operating system Red Hat 6.2.

The installation script provides a graphic user interface (GUI). Use the **Next** or **Done** keys to move to the next screen, the **Tab** key to move between items/buttons, the **Space** key to select and deselect items, the **Enter** key to expand items for editing, and **arrow keys** for moving between items in a list.

If it is necessary to re-enter the BIOS from the Terminal Server, use the Escape key sequence **<Esc><Shift>OQ** .

From the terminal server

1 Establish a terminal session to the Host CPU through the terminal server.

2 After the system boots from the Red Hat CD, the Red Hat installation menu appears. Type the following:
text console=ttyS1,9600n8 <Enter>

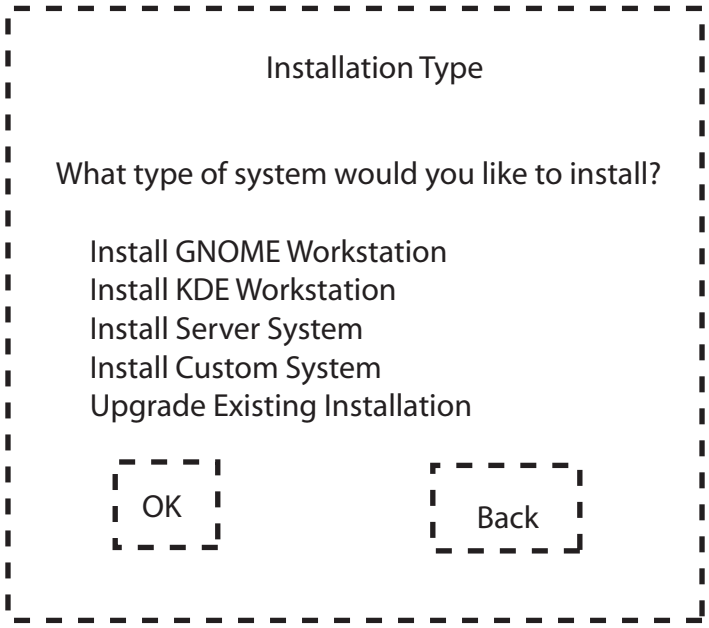
IMPORTANT: If the first character is not quickly typed, the Red Hat installation script will use the default automatic option and begin installation.

If entry is not typed correctly, reset the card using the reset button in the front of the 5370 card.

3 Select **English** for the Language Selection, then select **OK**.

4 In the Red Hat welcome screen, Choose the **Install Custom System** installation.

Figure 39 Red Hat: Installation Type screen



5 For **Bad Partition Table**, select **Initialize**.

Partitioning the hard drive

The following includes instruction to partition the hard drive.

From the terminal server

1 Press **w** and press **Enter** to save changes and exit.

2 Select **Done** and press **Enter** to continue.

3 At the **Disk Setup** screen, select the individual partitions and press **Tab** to move to the **Edit** button. Press **Enter**.

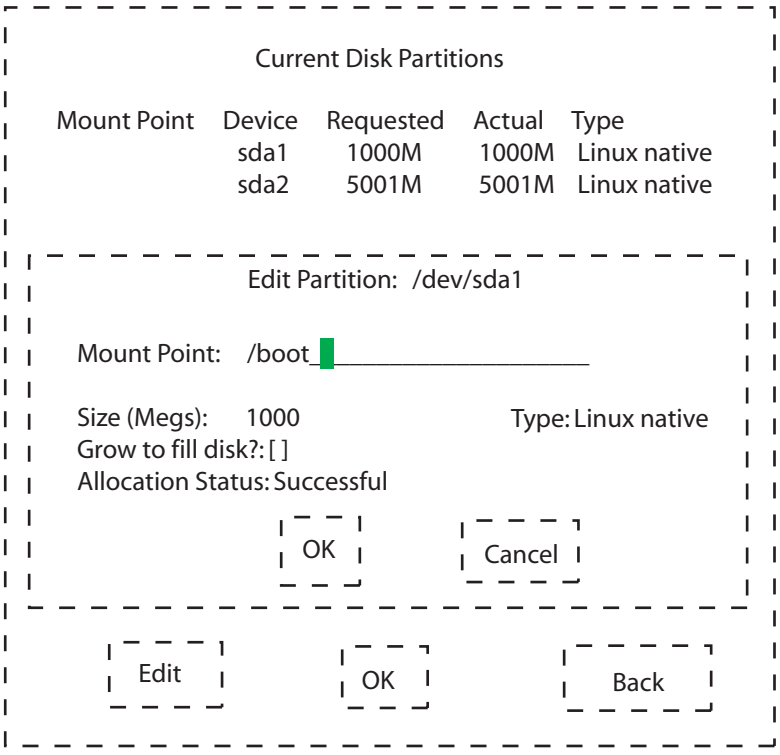
4 Type in the mountpoints. The highlighted line indicates the current cursor position. Press **Enter**, input the mountpoint in the text box, and press **Enter** again.

```
Partition 1: mountpoint = /boot <Enter>
Partition 2: mountpoint = / <Enter>
Partition 3: /swap <Enter>
Partition 5: mountpoint = /var <Enter>
Partition 6: mountpoint = /usr <Enter>
Partition 7: mountpoint = /IMS <Enter>
```

It is not necessary to enter the mountpoint for the swap partition, as this occurs automatically when this partition is designated as a swap partition.

Repeat for all partitions as necessary. Select **OK** when finished.

Figure 40 Red Hat: Mountpoints

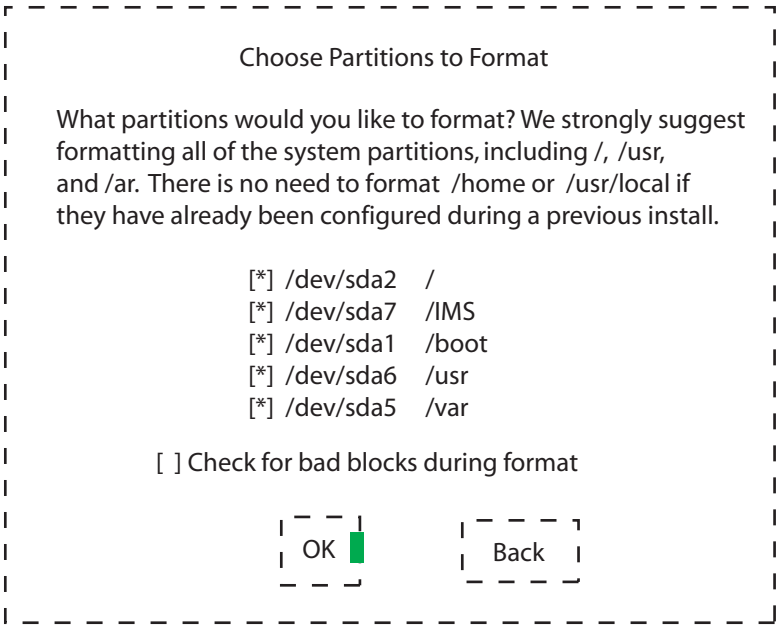


5 In the **Choose Partitions to be Formatted** screen, ensure all partitions are selected and the **Check for bad blocks** option is NOT selected.

```
[*] /dev/sda2    /
[*] /dev/sda7    /IMS
[*] /dev/sda1    /boot
[*] /dev/sda6    /usr
[*] /dev/sda5     /var
```

Press the **Tab** key twice to position the cursor on the **OK** button, and press the **Enter** key.

Figure 41 Red Hat: Formatting partitions



Completing the installation

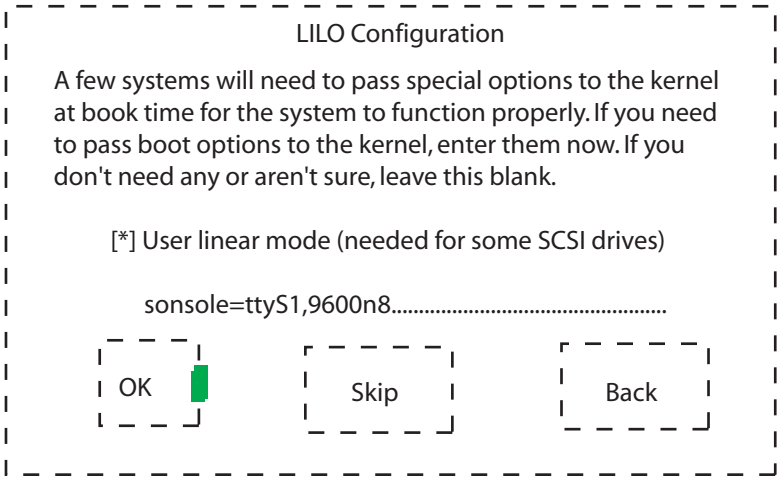
The following procedure includes instructions for completing the installation.

From the terminal server

1 The LILO Configuration screen appears. Ensure the **User linear mode (needed for some SCSI drives)** is selected.

2 Type the boot arguments for LILO as follows:
console=ttyS1,9600n8 <Enter>

Figure 42 Red Hat: LILO Configuration



Select **OK** when finished.

3 Ensure **/dev/sda** for the location to install LILO is selected, and select **OK** to continue.

4 Select **OK** to accept the default selection for the partition to boot the Linux OS.

5 The Host Configuration screen will appear. Type in the host name of the RTP Media Portal. Select **OK** when finished.

6 In the Network Configuration screen, de-select the **bootp/DHCP** check box.

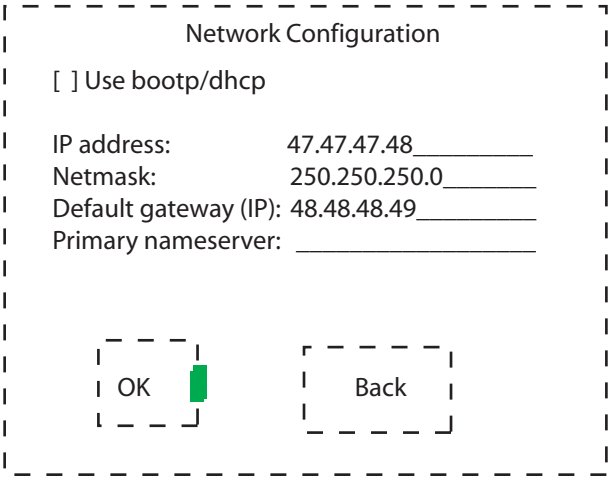
Enter nameserver IP addresses if they are available. If you enter nameserver addresses, ENSURE THEY ARE CORRECT. The RTP Media Portal will not function correctly if unreachable or otherwise incorrect nameserver IP addresses are used. If you do not have nameserver IP addresses, leave this field empty.

```
[ ] Use bootp/dhcp

IP address:              <eth0 IP of Host Card>
Netmask:                 <Host Card Netmask>
Default gateway (IP):    <Default Gateway>
Primary nameserver:
```

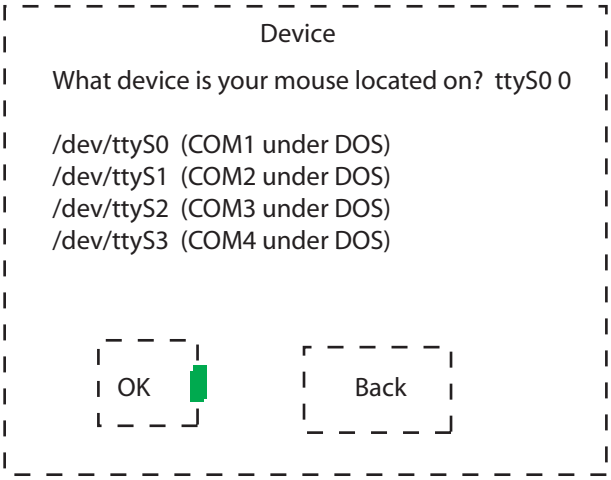
Select **OK** to continue.

Figure 43 Red Hat: Network Configuration screen



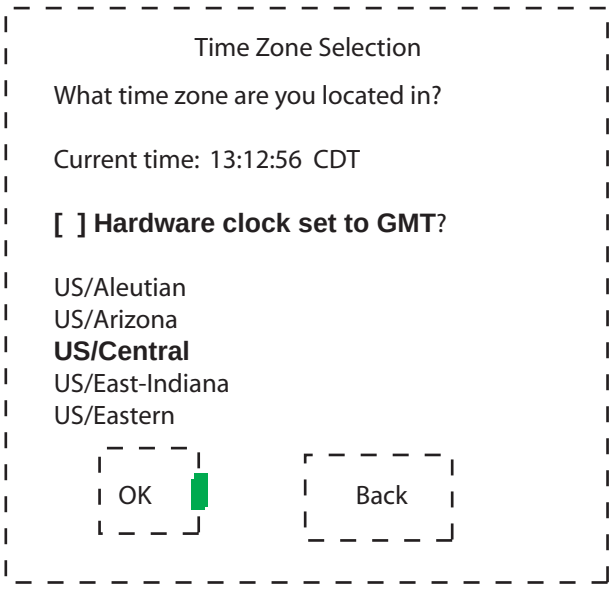
7 In the Device settings screen, accept the default setting and select **OK** to continue.

Figure 44 Red Hat: Device settings screen



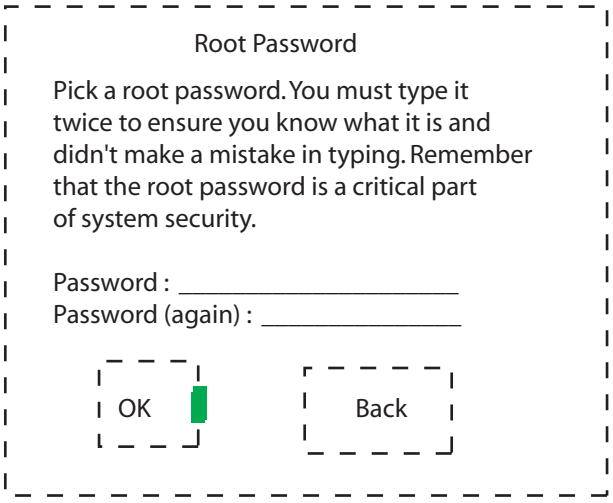
8 In the Time Zone Selection screen, select the appropriate local time zone and select **OK**.

Figure 45 Red Hat: Time Zone Selection screen



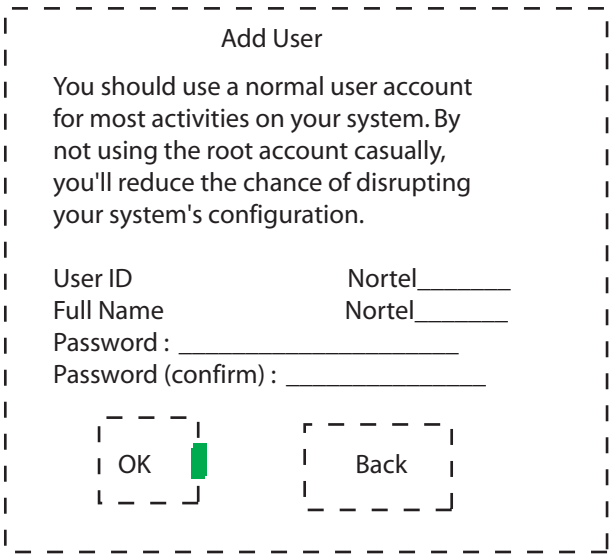
9 The next screen sets the root password. When prompted, enter the appropriate root password. Retype the password for confirmation and select **OK** to continue.

Figure 46 Red Hat: Root Password screen



10 The Add User screen appears. Create a “nortel” user account with password. Retype the password for confirmation and select **OK** to continue.

Figure 47 Red Hat: Add User screen



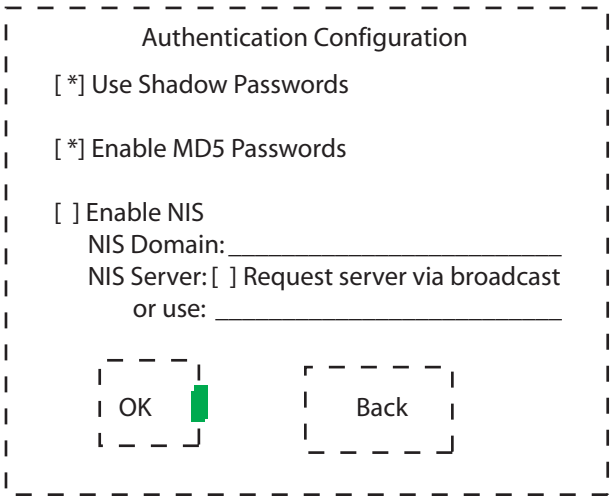
11 In the Authentication Configuration screen, verify the **Use Shadow Password** and **Enable MD5 password** check boxes are selected. Select **OK** to continue.

```
[*] Use Shadow Password

[*] Enable MD5 Password

[ ] Enable NIM
  NIS Domain:
  NIS Server: [ ] Request server via broadcast
       or use:
```

Figure 48 Red Hat: Authentication Configuration screen



12 Select the software packages to install the following.

- Networked Workstation
- NFS Server
- Anonymous FTP Server
- Utilities

De-select packages not included in this list. Select **OK** to continue.

13 Select **No** when asked if a boot disk is to be created.

14 Select **OK** to begin the installation. Installation will require approximately 10 minutes to complete.

Once completed, the system will prompt you to reboot and remove the installation CD from the CD-ROM.

IMPORTANT: Remove the CD before the POST boot sequence is complete, otherwise the base installation script will begin again. If this happens, press the reset button on the front panel of the Host CPU Card to reboot the system again.

Installing the RTP Media Portal packages

Once the Red Hat installation is complete, the RTP Media Portal and HA packages can be installed from the second CD.

From the terminal server

1 After the system reboots, the LILO prompt is displayed. Press **Tab** to halt the LILO boot process.

2 Insert the RTP Portal Install CD into the CD-ROM, and reboot the system by pressing the Reset button on the front of the Host CPU Card.

3 The system will reboot from the CD and begin executing the installation scripts.

4 Press **Tab** when the LILO prompt appears. Type **install-serial** at the prompt to begin the installation.

5 The system prompts for the following information.

```
Host CPU slot number: [7 or 9]
RTP Portal chassis number: [1, 2, 3,...]
Timeserver IP address:
Permanent system console type: s
Blade MAC addresses:
```

The chassis number is used to configure both the host and the Media Blades. They must be consistent. Also, the chassis number is used to construct a virtual address of the form 192.168.<chassis>.<slot>. This address MUST be unique on the MCP Service Network, so it is necessary for the chassis number to be selected based on its use to create this address.

Timeserver IP address(es) is generally the service logical IP of the Management Server.

If there is an error in the input, type **n** in the confirmation screen to re-enter the values. Otherwise, type **y** to continue.

6 When prompted, provide the MAC addresses for each of the I/O cards in the Domain. If there is no I/O card present in a slot, press **Enter** to skip to the next slot entry. Select **OK** to continue.

7 Installation will begin, requiring approximately 5-10 minutes. Do not touch the keyboard of the system until installation is complete.

8 Press **Enter** to continue. The system will reboot.

9 When the LILO prompt appears, press the **Tab** key to halt the process.

10 Remove the RTP Portal install CD from the CD-ROM, and reboot the system by pressing the Reset button on the front panel of the Host CPU card.

11 After the system reboots, use the escape sequence **<Esc><Shift>OQ** to return to BIOS set up. Remove everything from the boot device list except the hard drive (for security reasons).

12 Move to the **Exit** menu to save changes and exit the BIOS set up. The system will reboot.

13 After the system reboots, press the **Enter** key to boot the default image.

14 After booting, the login prompt will appear on screen.

Configuring Network Time Protocol

This section includes instruction for synchronizing the RTP Portal clock to the master clocks. This is performed automatically during installation if the user entered a Timeserver IP address in Installing the RTP Media Portal packages on page 101. Only modify the **ntp.conf** file if the timeserver address(es) change or if they were not entered at install time for some reason.

From the terminal server

1 Establish a serial terminal connection to the Host CPU card, and log in the system as **root**.

2 Create a new **ntp.conf** file in the **/etc** directory.

vi /etc/ntp.cont <Enter>

3 Add the following lines in the text.

server <Machine Logical IP of Management Server> <Enter>
server <Machine Logical IP of Accounting Manager> <Enter>

driftfile /etc/ntp/ntp.drift <Enter>

4 Save and exit the editor.

5 Verify the file was correctly saved.

more /etc/ntp.conf <Enter>

The display should match the contents entered in the previous step. Note the clock on the RTP Portal must be set to within one hour of the time set on the management servers, or Network Time Protocol will not be able to adjust the time. If the clocks differ by more than one hour, set the time manually.

date <MMDDHHMM> <Enter>

6 Exit **root**.

exit <Enter>

Installing MCPN765 cards

The following procedures outline instructions for adding MCPN765 I/O Cards in RTP Portal (Domain A). To add new I/O cards to Domain B, repeat these procedures.

From a terminal device and the System Management Console

1 Set the MCPN765 I/O card. For more information, refer to Setting up the MCPN765 I/O Card on page 104.

2 Configure the MCPN765 card. For more information, refer to Configuring the MCPN765 I/O Card on page 108.

Setting up the MCPN765 I/O Card

A terminal device (such as a dumb terminal, or PC COM port plus terminal software) is required to change the NVRAM settings on the MCPN765 I/O blade. The 765 serial port uses 9600/8/N/1 settings. Use the port labeled **COM1** on the rear transition module. A serial cable is required to connect to the I/O blade, as a specialized serial cable will not work.

From a terminal device

1 Once the blade and transition module has been physically installed in the chassis, connect the specialized serial cable to the COM1 port at the bottom of the transition module.

2 Press the reset button on the front of the MCPN765 card to reboot the card.

3 Press the **Esc** key to abort the re-boot process.

4 Set and enable the real time clock on the blade.

set <MMDDYYHHMM> <Enter>

5 At the Bug prompt, display the MAC address for the card.

niot ;h <Enter>

6 Record the MAC address for CLUN 0/DLUN 0 (NET1), and CLUN13/DLUN 0 (NET2).

CLUN 0/DLUM 0 (NET1): _____

CLUN 13/DLUN 0 (NET2): _____

7 Type **env** to verify, and change as necessary, BIOS settings on the I/O Card. Ensure they match the settings shown below.

Note the entries may appear differently depending on the version of BIOS loaded on each card. If an entry appears that is not described below, accept the default.

```
PPC6-Bug>env
Bug, AST or System environment [B/A/S] = B?
Maximum Memory Usage (Mb, 0=AUTO) = 0?
Field Service Menu Enable [Y/N] = N?
Probe System for Supported I/O Controllers [Y/N] =
Y?
Auto-Initialize of NVRAM Header Enable [Y/N] = Y?
Network PReP-Boot Mode Enable [Y/N] = Y?
SCSI Bus Reset on Debugger Startup [Y/N] = N?
Primary SCSI Bus Negotiations Type [A/S/N] = A?
Primary SCSI Data Bus Width [W/N] = N?
Secondary SCSI Identifier = "07"?
NVRAM Boot List (GEV.fw-boot-path) Boot Enable [Y/N]
= N?
NVRAM Boot List (GEV.fw-boot-path) Boot at power-up
only [Y/N] = N?
NVRAM Boot List (GEV.fw-boot-path) Boot Abort Delay
= 5?
Auto Boot Enable [Y/N] = N?
Auto Boot at power-up only [Y/N] = N?
Auto Boot Scan Enable [Y/N] = Y?
Auto Boot Scan Device Type List =
FDISK/CDROM/TAPE/HDISK/?
Auto Boot Controller LUN = 00?
Auto Boot Device LUN = 00?
Auto Boot Partition Number = 00?
Auto Boot Abort Delay = 7?
Auto Boot Default String [NULL for an empty string]
= ?
ROM Boot Enable [Y/N] = N?
ROM Boot at power-up only [Y/N] = Y?
ROM Boot Abort Delay = 5?
ROM Boot Direct Starting Address = FFF00000?
ROM Boot Direct Ending Address = FFFFFFFC?
Network Auto Boot Enable [Y/N] = Y?
Network Auto Boot at power-up only [Y/N] = N?
Network Auto Boot Controller LUN = 13?
Network Auto Boot Failover Controller LUN = 00?
Network Auto Boot Device LUN = 00?
Network Auto Boot Abort Delay = 5?
Network Auto Boot Configuration Parameters Offset
(NVRAM) = 00001000?
Watchdog prior status ignored at autoboot [Y/N] = Y?
Watchdog shutdown at board reset [Y/N] = N?
Reset Ethernet chip after file transfer [Y/N] = N?
Stop Auto Boot after selftest failure [Y/N] = N?
Memory Size Enable [Y/N] = Y?
```

```
Memory Size Starting Address = 00000000?
Memory Size Ending Address = 04000000?
DRAM Speed in NANO Seconds = 8?
ROM Bank A Access Speed (ns) = 90?
ROM Bank B Access Speed (ns) = 120?
DRAM Parity Enable [On-Detection/Always/Never -
O/A/N] = O?
L2Cache Parity Enable [On-Detection/Always/Never -
O/A/N] = O?
PCI Interrupts Route Control Registers (PIRQ0/1/2/3)
= 0A0B0E0F?
Serial Startup Code Master Enable [Y/N] = N?
Serial Startup Code LF Enable [Y/N] = N?
Firmware Command Buffer Enable [Y/N] = N?
Firmware Command Buffer Delay = 5?
Firmware Command Buffer : <Enter>
['NULL' terminates entry]?
Update Non-Volatile RAM (Y/N)? y
Reset Local System (CPU) (Y/N)? n
```

8 At the prompt, type **niot** to access the Network boot settings.

```
PPC6-Bug>niot
Controller LUN =00? 13
Device LUN =00?
Node Control Memory Address =03E1D8A0?
Client IP Address =0.0.0.0? 192.168.<chassis #>.<slot #>
Server IP Address =0.0.0.0? 192.168.<chassis #>.<hostcard #>
Subnet IP Address Mask =255.255.255.0?
Broadcast IP Address=255.255.255.255? 192.168.<cage
#>.255
Gateway IP Address =0.0.0.0?
Boot File Name ("NULL" for None) =?
/tftpboot/bladeRunner
Argument File Name ("NULL" for None) =?
Boot File Load Address =001F0000?
Boot File Execution Address =001F0000?
Boot File Execution Delay =00000000? 00000005
Boot File Length =00000000?
Boot File Byte Offset =00000000?
BOOTP/RARP Request Retry =00? 50
TFTP/ARP Request Retry =00? 50
Hardware error retry attempts =00?
Trace Character Buffer Address =00000000?
BOOTP/RARP Request Control: Always/When-Needed
(A/W)=W?
BOOTP/RARP Reply Update Control: Yes/No (Y/N) =Y?
Update Non-Volatile RAM (Y/N)? y
```

9 At the prompt, type **reset** to reboot the network once it completes the necessary self-tests.

```
PPC6-Bug>reset
Cold/Warm Reset [C,W] = C?
Execute Local SCSI Bus Reset [Y,N] = N?
Execute Local (CPU) Reset [Y,N] = N? y
```

10 Repeat this procedure for all I/O cards in the Domain. The Host Card IP address and the Broadcast IP address should be the same between all I/O Cards.

11 Unplug the console connection from the last I/O card.

12 Log in to the system as **root**.

13 Edit the **/etc/bladeEtherAddrs** file to change the MAC addresses for each of the new I/O cards in the system. It is only necessary to change the entries for slots that contain a card. If a slot is empty, or contains something other than a card, leave the corresponding entry as is.

vi /etc/bladeEtherAddrs <Enter>

For example, if the I/O card was added in slot 3, enter the new MAC addresses on the appropriate line as shown below.

```
##############################################
#MAC addresses for all blades in the system
#
#Format: <slot>: <private NET2 MAC>: <public NET1
MAC>
##############################################
1:FF00FF00FF00:FF00FF00FF00
2:FF00FF00FF00:FF00FF00FF00
3:<New NET2 MAC Addr.>:<New NET1 MAC Addr.>
4:FF00FF00FF00:FF00FF00FF00
5:FF00FF00FF00:FF00FF00FF00
6:FF00FF00FF00:FF00FF00FF00
11:0001af04666a:0001af04666b
12:0001af04a022:0001af04a023
13:0001af000709:0001af00070a
14:0001af040390:0001af040391
15::
16::
```

14 Save the file and exit the editor.

15 Exit root.

exit <Enter>

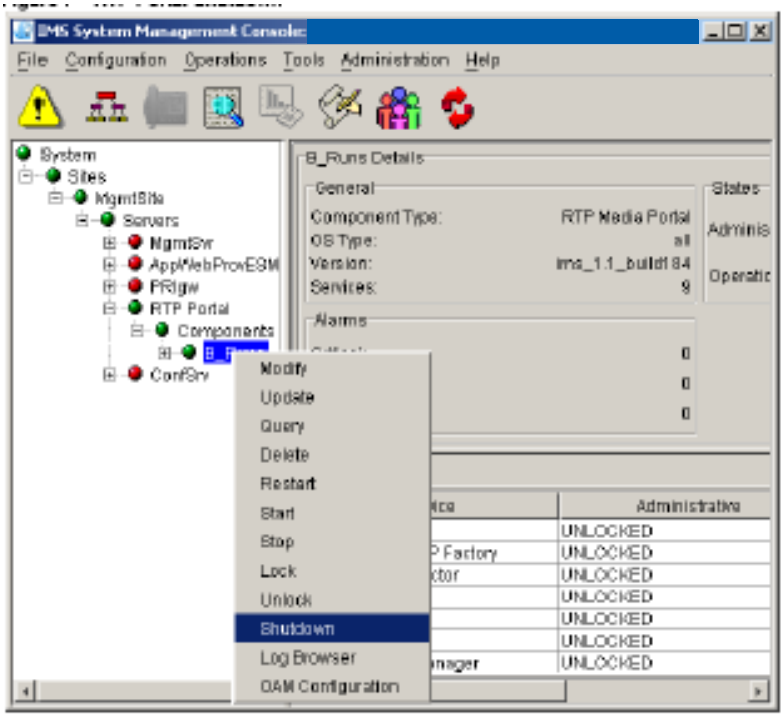
Configuring the MCPN765 I/O Card

It is recommended the following procedure be completed during maintenance hours as it will require the RTP Media Portal to reboot, and be out of service for approximately 15-20 minutes.

From the System Management Console

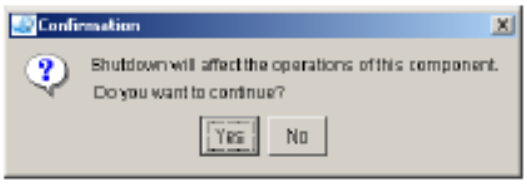
1 Expand the RTP Portal options, right-click on RTP Portal to select **Shutdown**.

Figure 49 RTP Portal Shutdown



2 A confirmation window appears. Click on the **Yes** button to continue.

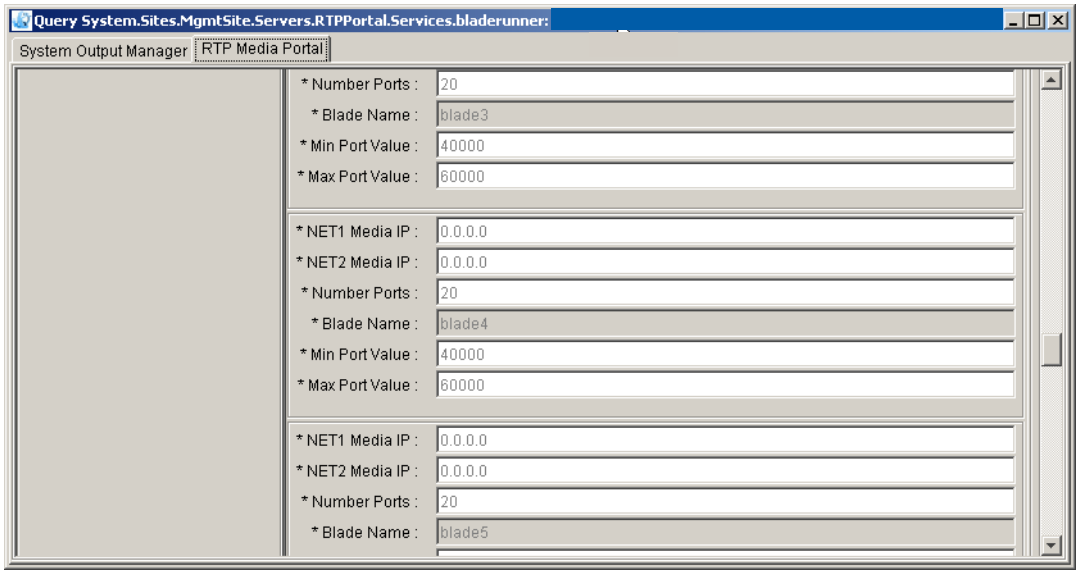
Figure 50 RTP Portal Shutdown confirmation



3 If it is NOT necessary to change the IP address of the MCPN765 card, skip to step 4.

If it is necessary to change the IP address, expand the RTP Portal options and right-click on RTP Portal to select **Modify.** From the **RTP Media Portal** tab to make the appropriate changes.

Figure 51 RTP Media Portal tab



No further action is required, and the final step in this procedure may be skipped.

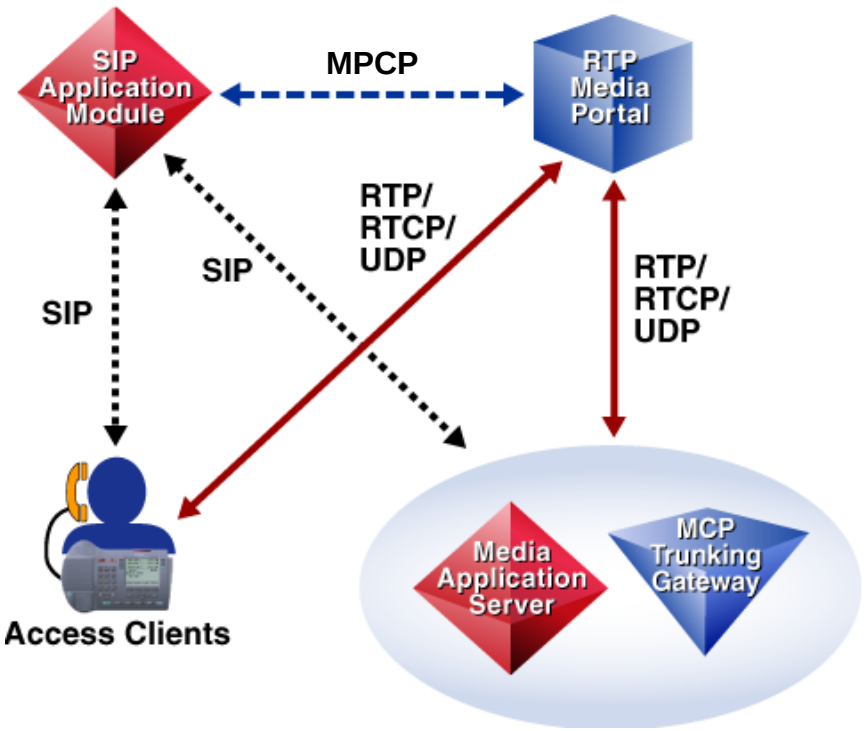
4 Expand the RTP Portal options and right-click on RTP Portal to select **Restart**. The system will reboot.

Appendix C: Basic call flows

As described in Protocols on page 13, the RTP Media Portal component interfaces to the other network components using different protocols. These protocols are used to establish and manipulate media paths through the RTP Media Portal. This enables the SIP Application Module to control the media plane throughout the life of a session.

Figure 52, Basic interoperability of components for a session, on page 111 shows the network components and protocols used to interface between components in order to handle SIP and media sessions.

Figure 52 Basic interoperability of components for a session

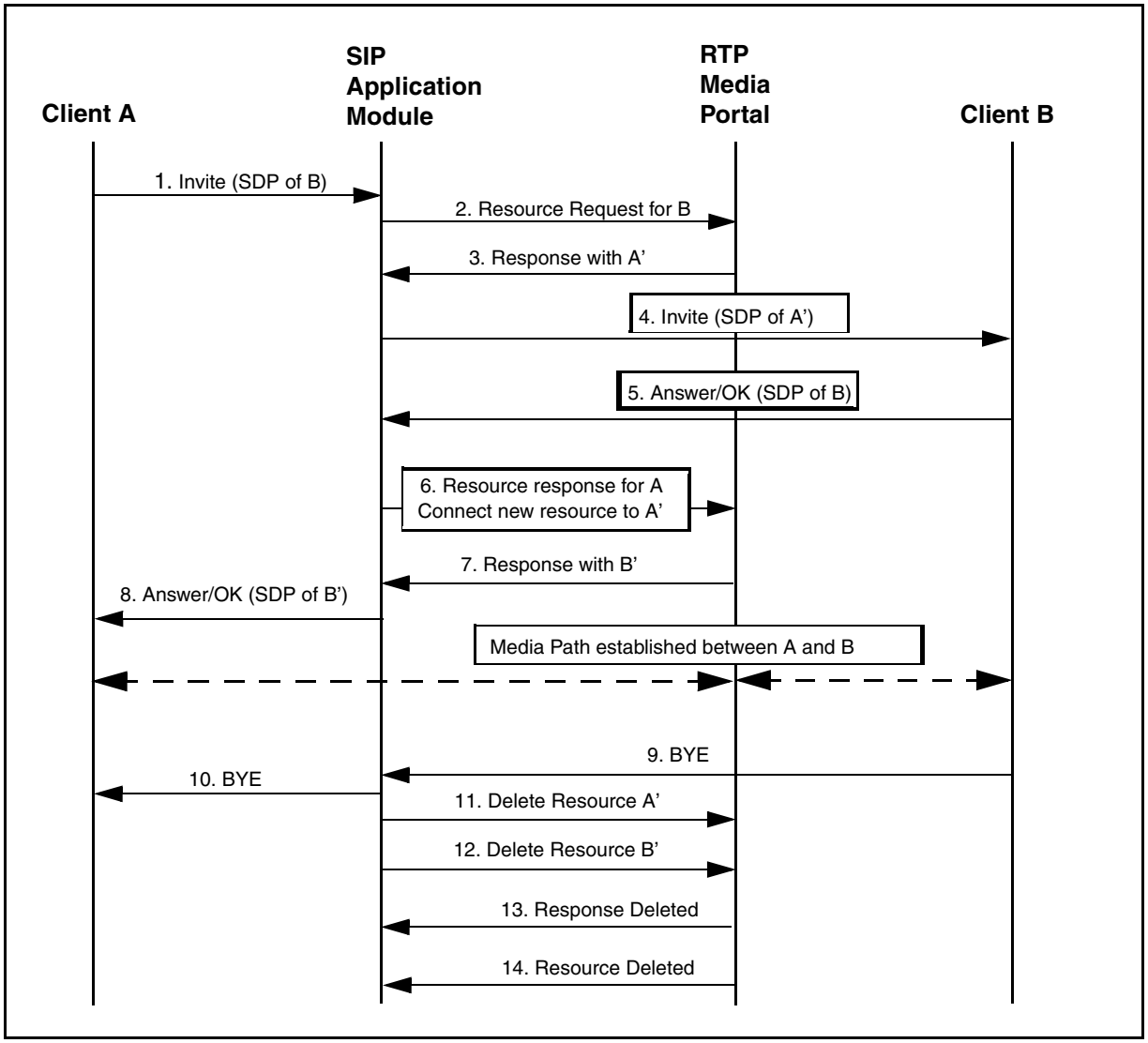


The following sections provide some sample diagrams and descriptions of call flows to review the basic functionality of the RTP Media Portal component.

Basic call without firewalls

Figure 53, Basic call flow using the RTP Media Portal (unobscured endpoints), on page 112 shows the basic call flow for a client-to-client call using an RTP Media Portal without any firewall/NAPT traversal requirements.

Figure 53 Basic call flow using the RTP Media Portal (unobscured endpoints)



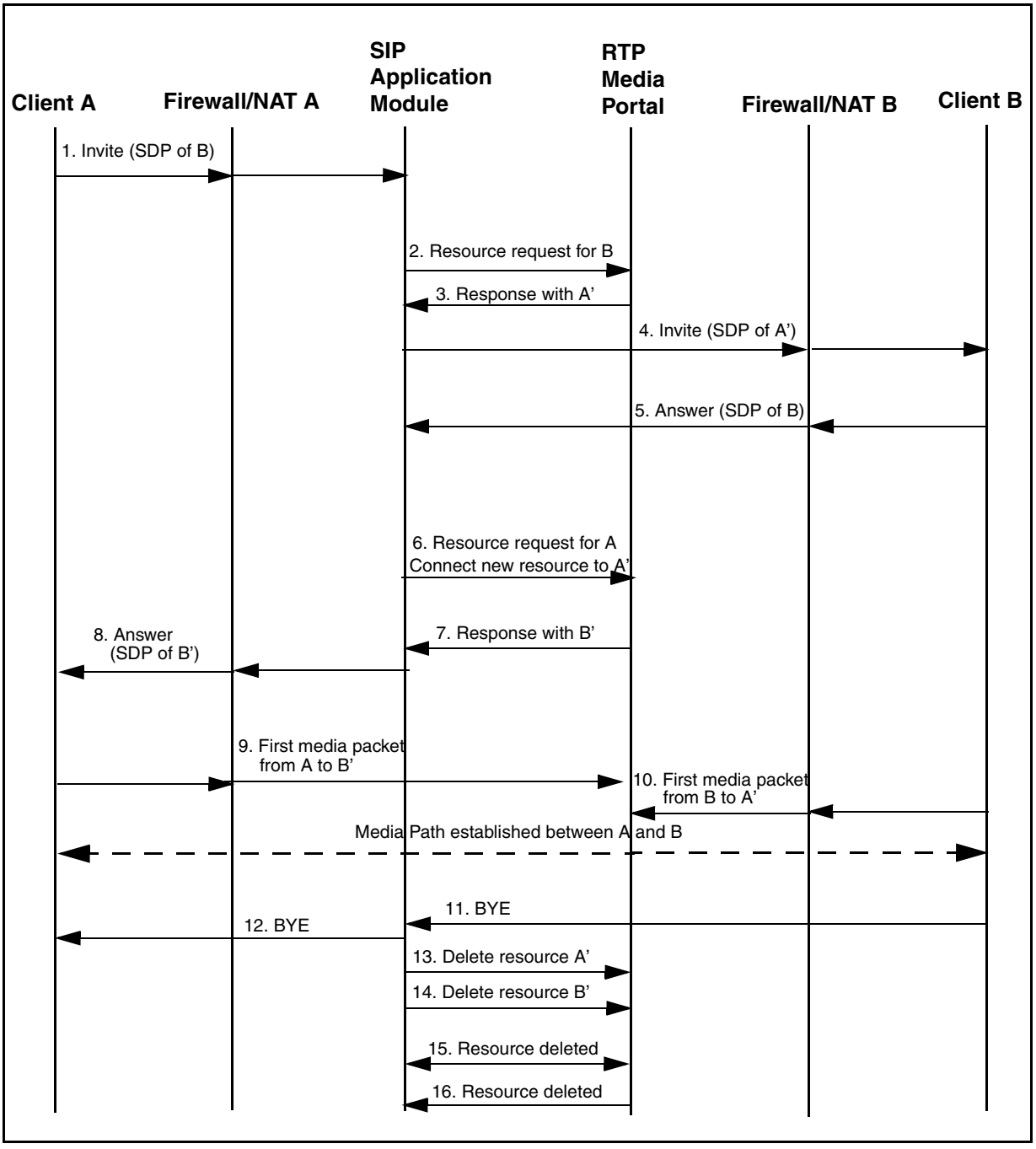
The following steps provide more detail about the call flow:

1. Client A initiates a SIP session to Client B by sending an Invite message to the SIP Application Module. Within the Invite message, Client A includes SDP information that identifies the called address (IP and port of B).
2. The SIP Application Module requests resources to support the half call (connection) between client B and the RTP Media Portal. The address and port of Client B are included in the request.
3. The RTP Media Portal allocates resources (an IP address and port) for Client B. The new resources (A') are returned to the SIP Application Module in the response.
4. The SIP Application Module forwards the original invite to Client B, substituting the address and port of Client A with the A' resources allocated by the RTP Media Portal.
5. Client B answers the incoming call. The SIP message sent to the SIP Application Module contains the address and port of Client B.
6. The SIP Application Module requests resources to support the half call (connection) between Client A and the RTP Media Portal. The address and port of Client A are included in the request.
7. The RTP Media Portal allocates resources (an IP address and port) for Client A. The new resources (B') are returned to the SIP Application Module in the response.
8. The SIP Application Module replaces the SDP information identifying the terminating address (B) with information identifying the terminating NAPT address (B'), and forwards on the OK message to Client A. At this point, both clients have the correct addresses to establish the media connection and media packets are being sent and received.
9. Client B disconnects the call by sending a BYE message to the SIP Application Module.
10. The SIP Application Module propagates the BYE to Client A.
11. The SIP Application Module tells the RTP Media Portal to free the resources for Client B.
12. The SIP Application Module tells the RTP Media Portal to free the resources for Client A.
13. The RTP Media Portal frees the resources and responds SIP Application Module.
14. The RTP Media Portal frees the resources and responds to SIP Application Module.

Basic call with firewalls

Figure 54, Basic call flow using the RTP Media Portal (with obscured endpoints), on page 114 shows the basic call flow for a client-to-client call using an RTP Media Portal with Address and Port Discovery (APD) functions enabled to facilitate firewall/NAPT traversal requirements.

Figure 54 Basic call flow using the RTP Media Portal (with obscured endpoints)



The following steps provide more detail about the call flow:

1. Client A initiates a SIP session to Client B by sending an Invite message to the SIP Application Module. Within the Invite message, Client A includes SDP information that identifies the called address (IP and port of B). The Invite passes through the firewall/NAT A.
2. The SIP Application Module requests resources to support the half call (connection) between Client B and the RTP Media Portal. The SIP Application Module knows that Client B is obscured, so a specific media address for Client B is not provided in the resource request sent to the RTP Media Portal.
3. The RTP Media Portal allocates resources (an IP address and port) for Client B. The new resources (A') are returned to the SIP Application Module in the response.
4. The SIP Application Module forwards the original invite to client B, substituting the address and port of Client A with the A' resources allocated by the RTP Media Portal. The invite passes through firewall B.
5. Client B answers the incoming call. The SIP message sent to the SIP Application Module contains the address and port of Client B. However, because Client B is obscured, the actual media address (the address from which media packets will be sent) is not yet known.
6. The SIP Application Module requests resources to support the half call (connection) between Client A and the RTP Media Portal. Again, because Client A is obscured, the specific media address and port of Client A are not included in the request.
7. The RTP Media Portal allocates resources (an IP address and port) for Client A. The new resources (B') are returned to the SIP Application Module in the response.
8. The SIP Application Module replaces the SDP information identifying the terminating address (B) with information identifying the terminating NAPT address (B') and forwards on the OK message to Client A. At this point, both clients have the correct addresses to establish the media connection. However, there is no complete media path through the Portal at this time, because the Portal does not yet know the actual media address of either client.
9. Client A sends the first media packet to address B'. At this point, the Portal examines the packet and extracts the source address, thus "discovering" the media address used by Client A. At this point, the connection between Client A and the Portal is complete. However, the packet cannot yet be forwarded to Client B since the media address of Client B is not yet known. The packet is dropped by the Portal.

10. Similarly, Client B sends its first media packet to address A'. The Portal discovers the media address used by Client B and completes the connection. Now that both endpoints are known, a complete media path exists through the Portal. The packet from Client B is forwarded to Client A. All subsequent packets sent by either endpoint are forwarded through the Portal to the other side of the call.
11. Client B disconnects the call by sending a BYE message to SIP Application Module.
12. SIP Application Module propagates the BYE to Client A.
13. The SIP Application Module tells the RTP Media Portal to free the resources for Client B.
14. The SIP Application Module tells the RTP Media Portal to free the resources for Client A.
15. The RTP Media Portal frees the resources and responds to the SIP Application Module.
16. The RTP Media Portal frees the resources and responds to the SIP Application Module.

Multimedia Communication Portfolio

Multimedia Communication Server

RTP Media Portal Basics

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